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The Essex Naturalist:

BEING THE

JOURNAL

OF THE

ESSEX FIELD CLUB.

EDITED BY

WILLIAM COLE, F.L.S., F.E.S.,

Honorary Secretary and Curator.

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The authors alone are responsible for the statements and opinions contained in their respective papers.

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ANCIENT BOAT FOUND IN EXCAVATING THE RESERVOIRS IN THE MARSHES OF THE LEA VALLEY, WALTHAMSTOW, ESSEX.

THE COMING OF AGE OF THE ESSEX FIELD CLUB. A RECORD OF LOCAL SCIENTIFIC WORK; 1880—1901.

By RAPHAEL MELDOLA, F.R.S., V.P.C.S., F.R.A.S., F.I.C., V.P.R. PHOTOG. SOC., *Professor of Chemistry in the Finsbury Technical College, City and Guilds of London Institute; Member of the Faculty of Science, University of London. President of the Club, 1880-1882 & 1901-1902.*

[Being the Presidential Address delivered at the 22nd Annual General Meeting of the Club on March 22nd, 1902.]

> "Our Society, in general terms, may be said to have for its scope the study of Nature in the field. . . . . .
>
> "In forming a Society such as the present Field Club our primary object is, of course, the furthering of Science—the annual addition of something, however humble, to the general stock of human knowledge. In Epping Forest and the County of Essex we have a fine area to work in. . . . . .
>
> "Thus, in addition to the acquisition of new knowledge, field clubs are capable of doing good work in the way of education. The faculty of paramount importance to the scientist is that of *observation*, and no study is better calculated to develop this faculty than that of Natural History."
>
> [From the Presidential Inaugural Address, Feb. 28th, 1880.]

Not often in the annals of a scientific society does it fall to the lot of the same individual to be called upon to occupy the presidential chair after an interval of twenty-one years. I acceded to the wish of your Officers and Council that I should again take office as President in celebration of our coming of age, partly on the unsubstantial ground of sentiment and partly because I may claim to have taken an active interest in the welfare of the Club and to have kept in touch with its proceedings from the time of the foundation meeting on January 10th, 1880. Twenty-one years measure a serious gap in the lifetime of an individual, and many whose names appeared in our first list of members have passed away during that interval. But it is satisfactory to be able to state that the hand of death has dealt lightly with our officials. With the exception of Mr. E. Durrant, every member of the Society who has ever held office—either as President, Vice-President, Treasurer, Secretary, or Librarian, is still with us in full vigour although in some few

cases no longer on our list of members. This continuity of association between past and present officers and the existing Club, composed largely of a newer generation, is certainly a remarkable feature in our history and is the best guarantee of future stability.

The fact that our list of members is now being recruited by the younger generation that has arisen since the time of our foundation is to me one of the healthiest signs of progress. Those who have only joined our ranks in recent years, and who are not familiar with our early history, may be interested to have from one who has been for so long intimately associated with the work of the Club a summary of the results which we have given to the scientific world in justification of the position which we assumed at the outset of our career. The inaugural address which I had the honour of delivering from this chair on February 28th, 1880, and from which I have taken the liberty of quoting the few extracts above, clearly defined our position as a scientific society. I now claim the privilege as the deliverer of that first presidential address, and by virtue of the office which you have again conferred upon me, of summing up our achievements during the past twenty-one years for the information of our newer members, for the encouragement of our old and tried colleagues and for the benefit of the future prosperity of the Society.

It is not my intention on the present occasion to recapitulate the steps in the history of the development of the Club, since a concise summary was given in the Council Report for the year 1900, and published in the Essex Naturalist (vol. XII., p. 37). Neither do I intend to trouble you with the usual statistical statements showing the fluctuations in the numbers of our members, since these will be found in the various annual reports of the Council. But with regard to the *personnel* of the Club I should like to take advantage of the present opportunity of going over the death roll of our members in order to emphasize our scientific strength in the past with a view to handing on to the future that same scientific ideal which we have always endeavoured to maintain. The list of Honorary Members as it now stands, and which we have at this meeting strengthened by the names of Sir Wm. Thiselton Dyer, Profs. E. Ray Lankester, Marshall Ward, G. B. Howes and J. B. Farmer, Messrs. C. H. Read, H. B. Woodward and W. H. Dalton, is

sufficient guarantee of the interest in our work taken by many of the leading men of science of our time. Reverting to the past, we find that we have had on our list of members Charles Darwin, whose life-work formed the subject of my presidential address in 1883 (*Trans. E.F.C.*, vol. III., 59), Sir Antonio Brady (*Ibid.*, 94), George Stacey Gibson and John Eliot Howard whose life and work were referred to by Prof. Boulger in his presidential address for 1884 (*Trans.*, vol. IV., 1 and 8); Prof. John Morris, the geologist, referred to by Mr. T. V. Holmes in his presidential address for 1886 (*Proc.*, vol. IV., clxxxiii.); the Rev. Thomas Benson, the botanist, and Lt.-Col. Champion Russell, of whom notices appear in the ESSEX NATURALIST for 1887 (vol. I., 138-139),[1] by Mr. E. A. Fitch and Mr. Walter Crouch; E. G. Varenne, of Kelvedon, whose life and work formed the subject of a memoir by Prof. Boulger in 1890 (ESSEX NATURALIST, V., 42); Sir Richard Owen; Sir William Flower, whose biography written by Mr. Crouch was published in 1900 (*Ibid.* XI., 243); General Pitt-Rivers, whose biography was written by Mr. Reader (*Ibid.* 245); George James Symons, the well-known meteorologist, of whom an obituary notice appears in the last part of the ESSEX NATURALIST (XII., p. 57) and Mr. T. Hay Wilson, of whom a notice from the pen of Mr. T. V. Holmes appears in the same part (*Ibid.* 60).

The actual work accomplished down to the present time will be found in the nineteen volumes of our publications; five volumes of *Transactions* and *Proceedings*, and, commencing in 1887, eleven volumes of the ESSEX NATURALIST together with the three volumes of *Special Memoirs*. It is not only by the number of printed pages, however, that our work will be judged in the future. A study of the contents of these nineteen volumes will show that we have on the whole kept faithfully to the programme as set forth in our original Rules:—

"The investigation of the natural history, geology and archæology of the County of Essex (special attention being given to the fauna, flora, geology and antiquities of Epping Forest); the publication of the results of such investigations, &c."

Under the various headings adopted in this earliest definition of our functions, I now propose to pass in review the more important pieces of work which have been placed upon record in

1 I gave an account of Col. Russell's work as a photographer in 1888 (ESSEX NATURALIST III., p. 117.)

our volumes, the subject of natural history resolving itself most conveniently into zoology and botany.

I.—ZOOLOGY.

In zoology, as in other branches of science, two kinds of work may be and should be carried on by a local society. There is work of an educational or pioneering character which consists in the exposition by a master specialist of the natural history, in the broadest sense, of some particular group of organisms with a view to the creation of an interest in that group so as to induce working members of the Society to take up its serious study. The other kind of work is the systematic recording of the species with the object of preparing lists of the present native inhabitants of the County—in other words, the compilation of a County Fauna. Such faunistic lists are valuable in proportion as they contain original notes and observations on the species recorded, but even bare lists are of value as showing for the use of future naturalists what species occurred in the district at a certain period. We can lay claim to have carried on both branches of work, although it does not appear that the efforts of those who have endeavoured to arouse enthusiasm with respect to the study of particular groups have met with much practical response. I learn that this experience is, however, pretty general among local societies, and it would be unjustifiable to draw the conclusion that Essex workers are less receptive than those in other counties. One of the first addresses of the pioneering kind given to our Club was that on the Infusoria, by Mr. Saville Kent, in 1881 (*Trans.*, II., 44). Mr. Kent also gave an address on the water-mites, Hydrachnida, in 1882 (*Proc.*, III., xliv.) and Mr. Brunetti and Mr. Verrall on Diptera in 1889 (ESSEX NATURALIST, IV., 85). The Rev. Hilderic Friend also has published a series of no less than seven papers on Annelids which were intended to raise an interest in this group (ESSEX NATURALIST, V., 193, 237; VI., 31, 60, 107, 169, 185) and which likewise comprise lists of Essex species. The first of Mr. Scourfield's series of three papers in 1897 on the Entomostraca of Epping Forest may also be regarded as an excellent representative of this class of pioneering work (ESSEX NATURALIST, X., 193, 260, 313) and Mr. Lovett's address in 1900 on the Stalk-eyed Crustacea (*Ibid.* XI., 252) comes under the same category. The addresses on Arachnida by Messrs. F. P. Smith and F. O. Pickard-Cambridge in 1900, although not published *in extenso*,

will no doubt linger in the memories of those who were present at the meeting (*Ibid* XI., 294.)[2]

Such papers as those referred to have in many cases also comprised most important contributions to the County Fauna, but most of our purely faunistic work appears in the form of special memoirs, local lists, notes communicated to our Editor or in reports of field-meetings. I have not attempted to collate all the records contained in the stray notes scattered throughout our publications, but I may call attention to the larger systematic works and papers. In the first place two of our Special Memoirs are faunistic in character, the *Birds of Essex*, by Mr. Miller Christy, published in 1891, and the *Mammals, Reptiles and Fishes of Essex*, by our former President, Mr. Laver, published in 1898. These two volumes together furnish a complete list of the Vertebrate animals of our County. A preliminary list of the Mammalia was communicated to the Club by Mr. Laver in 1881 (*Trans.*, II., 157). In addition to these two Special Memoirs many papers and notes relating to the Vertebrate Fauna of Essex will rank as permanent contributions to local natural history. The Epping Forest deer formed the subject of a paper by Mr. Harting in 1884 (ESSEX NATURALIST, I., 46) and the so-called "wolf" of the Forest had his true history narrated and stripped of romance by our Hon. Secretary in a supplement to the fourth and last volume of the *Proceedings* (IV., cciv). Those casual visitors to our shores, the whales, have also been duly recorded, the first Rudolphi's Rorqual by Sir Wm. Flower in 1883 (*Trans.*, IV., iii.), the second by Mr. Walter Crouch in 1887 (ESSEX NATURALIST, II., 41), and the third, also by Mr. Crouch, in 1891 (*Ibid.* V., 124; VII., 50). The bats of Epping Forest are recorded from the late Mr. Edward Newman's list in an appendix to the inaugural address (*Trans.*, I., 23) and again in the ESSEX NATURALIST with descriptive notes by Mr. Cole (IX., 134.)

The birds of Essex have been kept well under observation since the foundation of the Club. The occurrence of the Great Bustard and the Rough-legged Buzzard, near Chelmsford, was the first ornithological contribution from Mr. Miller Christy in 1880 (*Proc.*, I., v.; *Trans.* I., 59). Mr. Christy's Special Memoir above referred to is universally regarded as the standard monograph on our avifauna. You will be glad to learn that

2 Mr. Smith's first paper on the Spiders of Epping Forest was read at the meeting of the Club on March 8th, 1902.

Mr. Christy has kept this work well up to date by preserving all the later records, and these will in due course be communicated to the Club. It must always be a matter of satisfaction to us in turning over the records of our past work to know that the Essex Field Club has borne no inconsiderable part in that movement which has led to the protection of wild birds of the County under the Acts of Parliament of 1880 as amended in 1894. The matter was first brought before our Council by Mr. Christy in 1895, and a petition was drawn up by our Hon. Secretary on behalf of the Council and sent to the Essex County Council the same year. The County Council appointed a Committee under the Chairmanship of Mr. Champion Russell to consider our proposals, which proposals were subsequently accepted (ESSEX NATURALIST, IX., 42) and Mr. Russell brought the subject under the notice of our members in a paper (*Ibid.* 218) in which he stated that an "Essex Bird Protection Society" had been called into existence at a public meeting held at Chelmsford in 1896. That Society is still in existence and is doing good work—especially in relation to the coast birds, and its labours have from time to time been recorded in our pages (*Ibid.* IX., 255; X., 274). The later working and developments of the Act have also been duly noted (*Ibid.* X., 133; XI., 10) and the special and successful efforts made by Mr. Edward North Buxton to secure absolute protection for the birds of the whole of the Epping Forest district were recognized by the Club and acknowledged in a formal vote of thanks passed at the 17th Annual General Meeting in 1897 (*Ibid.* X., 15; see also pp. 56 and 276 and XI., 10). Among other contributions to Essex ornithology I may recall the very interesting discussion on the sparrow as an agricultural depredator opened at a meeting of the Club on May 20th, 1882, by the late Lt.-Col. Russell (*Proc.* III., xx-xxvii), the paper on the re-appearance of Pallas's Sand Grouse in 1888, compiled by our Secretary (ESSEX NATURALIST, II., 61), Mr. Harting's paper on the introduction of the *Tinamu* into Essex (*Ibid.* 102), Mr. Fitch's papers on Essex Heronries (*Ibid.* 171) and on the gulls and other birds frequenting the Tollesbury marshes (*Ibid.* 193), and Mr. Percy Clark's visits to the Black-headed Gulls in 1898, 1899 and 1900 (*Ibid.* X. 388; XI., 184; 312). The general subject of bird-migration was dealt with by Mr. Fitch in his presidential address in 1890 (*Ibid.* IV., 1).

Of the Essex Invertebrate Fauna, the Mollusca have, perhaps, received the most attention. One of our first contributions to this subject was Mr. Laver's list of the land and fresh-water Mollusca of the Colchester district (*Trans.* II., 88). The later papers relating to the recent and fossil Mollusca of the County are given below in chronological order :—

"Preliminary List of the Land and Fresh-water Mollusca occurring in the neighbourhood of Felstead"; J. French, ESSEX NAT., II., 1 and 46.

"List of Mollusca occurring in an alluvial deposit of the Cann Valley"; R. W. Christy; *Ibid.* III.; 7.

"On the Mollusca of the Shell Marl occurring at Felstead and in other parts of Essex"; J. French, with remarks by W. H. Dalton, *Ibid.* III., 11.

"List of Land and Fresh-water Mollusca from the Alluvial Deposit at Roxwell"; R. W. Christy and B. B. Woodward, *Ibid.* III., 176.

"On the occurrence of *Cyclostoma elegans* in a living state at Felstead"; J. French, *Ibid.* IV., 92.

"On the Land and Fresh-water Mollusca collected in Wanstead and the neighbouring Districts in the Becontree Hundred"; W. Crouch, *Ibid.* IV., 202.

"List of Land and Fresh-water Mollusca occurring in the neighbourhood of Bishop's Stortford"; E. G. Ingold, *Ibid.* IV, 215 and V., 202.

"Note on *Hydrobia jenkinsi*"; Edgar A. Smith, *Ibid.* IV., 212.

"Notes on the Mollusca of the Thames Estuary, with a list of Species observed"; A. J. Jenkins, *Ibid.* V., 220.

"On the occurrence of *Crepidula fornicata*, L. off the Coast of Essex"; W. Crouch, *Ibid.* VIII., 36; X., 353.

"Pleistocene Non-marine Mollusca from Walton-on-the-Naze"; W. M. Webb, *Ibid.* VIII., 160.

"Note on the Shells from the Brick Earth at Chelmsford"; W. M. Webb, *Ibid.* IX., 19.

"The Non-marine Mollusca of Essex"; W. M. Webb, *Ibid.* X., 27; 65.

"The Post-Pliocene Non-marine Mollusca of Essex"; A. S. Kennard and B. B. Woodward; with contributions by W. M. Webb, *Ibid.* X., 87.

"Notes on the Mollusca (Post-Pliocene and Recent) of Felstead"; A. S. Kennard and B. B. Woodward, *Ibid.* X., 185.

"The Post-Pliocene Non-marine Mollusca of Ilford"; A. S. Kennard and B. B. Woodward, *Ibid.* XI., 213.

"The Non-marine Mollusca of the Walton Crag"; A. S. Kennard and B. B. Woodward, *Ibid.* XI., 216.

"Pleistocene Non-marine Mollusca from Clacton-on-Sea"; W. M. Webb, *Ibid.* XI., 225.

"Notes on the Mollusc *Paludestrina jenkinsi*, Smith, in Essex and elsewhere"; A. S. Kennard and B. B. Woodward, *Ibid.* XI., 288.

I think this remarkable series of contributions speaks well for the activity of the malacologists. Our entomologists have also shown considerable activity, but there is yet an immense

amount of work to be done with respect to our Insect Fauna. Mr. Fitch's admirable paper on the "Galls of Essex" read in 1881 (*Trans.* II., 98), and supplemented in 1887 by a paper on two new Essex gall-makers (ESSEX NATURALIST, I., 177) furnishes us with an excellent example of a monograph on a most interesting group of insects, and when Mr. E. J. Lewis's paper on the "Oak Galls and Gall Insects of Epping Forest" (ESSEX NATURALIST, XII., 41) is published we may congratulate ourselves on having been the means of giving to naturalists a very substantial body of authentic observations. The Lepidoptera, always a favourite order with collectors, have formed the subject of several communications of which the first was Mr. Gilbert Raynor's paper in 1882 on "The Macro-Lepidoptera of the District around Maldon" (*Trans.* III., 30). In 1889 the late Mr. Howard Vaughan gave us his "Notes on the Lepidoptera of Leigh and its neighbourhood" (ESSEX NATURALIST, III., 123). No general list of the Lepidoptera of the County has as yet been compiled, although the first instalment, the list of butterflies, was prepared and published by Mr. Fitch in 1890 (ESSEX NATURALIST, V., 74) and in the same year I published a list of the species taken at Leyton and in the neighbourhood (*Ibid.*, 153 and supplementary records, VIII., 128). The materials for a complete list are in existence, and it is to be hoped that Mr. Fitch will be induced to complete the work which he has commenced so well. A preliminary list of the Arachnida of Epping Forest was contributed in 1883 by the Rev. O. Pickard-Cambridge (*Trans.* IV., 41) and a further contribution by Mr. F. O. Pickard-Cambridge in 1900 (ESSEX NATURALIST, XI., 315).

Natural history observations of value are incorporated with much of the faunistic work above referred to. The preparation of lists of species is undoubtedly an important and necessary part of the work of a local society—especially during the early period of its existence. No less important is the observation of life-histories, habits, and the general relations between the living organism and its environment known under the comprehensive designation of Bionomics. Many notes and papers on Bionomics and on general natural history appear in our volumes although, as might be expected, such communications are few as compared with the purely faunistic papers. As coming under this heading I may refer to Mr. Fitch's paper on the Bean Beetle, *Bruchus*

rufimanus (ESSEX NATURALIST, II., 48), the natural history of the "Essex Emerald" moth, *Euchloris (Phorodesma) smaragdaria*, compiled by our Secretary (*Ibid.* I., 120) and supplemented by Mr. Fitch (*Ibid.* 204), my own observation on the tarsal scent-tufts of the Deltoid moth, *Herminia (Aethia) tarsipennalis* (*Ibid.* II., 113), Mr. Kerry's observation on the migration of *Pieris brassicæ* at Harwich (*Ibid.* VI., 205), Dr. H. C. Sorby's notes on the food of oysters in Essex (*Ibid.* X., 169), and, among our first contributions, Mr. Arthur Lister's note on the parasitism of Rotifers in cysts on *Vaucheria* (*Proc.* III., xlv.). An interesting paper on the worm-eating slug, *Testacella scutulum*, Sowerby, was published by Mr. W. M. Webb in the *Zoologist* in 1893 (XVII., 251) and in the ESSEX NATURALIST (VII., 120). The slug itself had been found at Buckhurst Hill and elsewhere in Essex and had been exhibited by Mr. H. C. Snell at our meeting on March 14th of that year (*Ibid.* 46).

In connection with this subject it will be found also that we have not neglected our duty as regards the registration of new and rare species which have occurred in the County. The first occurrence observed in Essex, and, in fact, in England, of the Rhizopod, *Clathrulina elegans* was recorded by our late member, Mr. Charles Thomas, in 1884 (*Trans.* IV., 50), the new Butterfly, *Hesperia lineola* was duly noticed (ESSEX NATURALIST, IV., 191), two new Essex worms, one new to Britain and another belonging to a genus and species new to science had their names and addresses recorded by the Rev. Hilderic Friend in 1896 (*Ibid.* XI., 110) and the same writer has also noted the occurrence of a unique species of well-worm at Chelmsford (*Ibid.* XI., 1), prefaced by a most valuable general introduction to the study of the *Phreoryctes*. The discovery of the hitherto unknown male of the remarkable Hymenopterous insect, *Prestwichia aquatica*, in a pond in Epping Forest, was recorded in 1896 by Mr. Frederick Enock (*Ibid.* X., 10), while Mr. W. M. Webb notified in 1899 the occurrence of a species of woodlouse (*Porcellio ratzburgi*, Brandt.) new to Britain, from Warley and (possibly) Brightlingsea (*Ibid.* XI., 127).

Some of the communications which have been published by the Club deal with the marine zoology of particular trawling and dredging excursions or cruises, such, for example, as Mr. E. A. Fitch's interesting report on "A Day on the Crouch River," Mr. Crouch's further notes on the River Crouch

(ESSEX NATURALIST, VI., 81) and Dr. H. C. Sorby's "General Remarks on the Marine Natural History of the Colne Estuary" (*Ibid.* X., 166). A few of our members have also dealt with the very interesting question of local changes in the fauna and flora observed within the period of their own experience. Mr. Laver gave us his reminiscences of the Rochford Hundred in 1888 (*Ibid.* III., 27). Mr. French has treated of the same subject with respect to the neighbourhood of Felstead (*Ibid.* VI., 191) and has published a more general paper on the local extinction and diffusion of Essex Molluscs (*Ibid.* XI., 86), while Dr. H. C. Sorby has quite recently enriched the ESSEX NATURALIST with a paper "On the Variations in Numbers and Habitat of Marine Animals on the Coast of Essex during the last ten or twelve years" (*Ibid.* XII., 17). Mr. Laver's presidential address of 1893 on the periodicity of organic life raises some interesting questions in general biology (*Ibid.* VII., 51).

One other aspect of our zoological work may be considered here, although it equally affects the botanists. I refer to the subject of collecting specimens. The policy of the Club in this matter was declared in unmistakeable terms in our original Rules :—

"The Club shall strongly discourage the practice of removing rare plants from the localities where they are to be found or of which they are characteristic, and of risking the extermination of birds and other animals by wanton persecution ; and shall use its influence with landowners and others for the protection of the same and to dispel the prejudices which are leading to their destruction." Additional remarks in the same sense were made in my Inaugural Address (*Trans.* I., 11) and the action taken by us with respect to the protection of wild birds is the direct outcome of this policy. I may remind you furthermore that a special meeting of the Club on Feb. 25th, 1882, was devoted entirely to this question of the protection of wild animals and plants, and the discussion and papers on the subject by experts were all brought together and printed as an appendix to the third volume of our *Proceedings* (vol. III., *Appendix* I). More recently, in 1897, it will be remembered that another meeting, held at Easton Lodge at the invitation of our member, the Countess of Warwick, was also devoted to the consideration of

the whole question of "the protection of our native Fauna and Flora from the destruction and actual extermination which now threaten many interesting species." (ESSEX NATURALIST, X., 179). On this occasion Mr. C. G. Barrett, Mr. Harting and Prof. Boulger dealt with the necessity for protecting the rarer insects, birds, mammals and plants respectively. It is to be hoped that this policy will be strenuously maintained during the future career of the Club. Since the year 1880, when the original rule was framed, new sources of danger have arisen which make the protection even of our commoner animals and plants (unless absolutely destructive) a matter of serious importance. I refer to the introduction of "nature-teaching" into rural schools, an innovation in educational methods at which nobody can rejoice more than I do, but which, unless kept well in check at the outset, is liable to lead to wanton destruction by the undisciplined raids of uninstructed school children (see ESSEX NATURALIST, XI., 236, and *Nature*, Vol. LXIV., p. 394, August 22nd, 1901).

II.—BOTANY.

Many contributions to the local lists of plants will be found throughout our publications. Among general lists I may refer to Mr. Shenstone's reports on the flowering plants of the Colchester district (ESSEX NATURALIST, I., 22; III., 222), Mr. Powell's paper on the flowering plants of Epping Forest (*Ibid.* VI., 1) and Mr. F. W. Elliott's paper on the trees and shrubs of Epping Forest (*Ibid.* X., 377). As Essex is the home of the rarest British *Primula*, *P. elatior*, it is but natural that this genus should have received special attention, and our first botanical contribution of importance was Mr. Miller Christy's paper in 1882-83 on the species of the genus *Primula* in Essex (*Trans.*, III., 148), followed in 1891 by Mr. French's paper on the range of *P. vulgaris* and *P. elatior* in N. Western Essex (ESSEX NATURALIST, V., 120), and in 1898 by Mr. Miller Christy's notes on a phyllodic aberration of *P. acaulis* and on a hybrid between *P. elatior* and *P. veris* (*Ibid.* X., 307). Mr. Shenstone's paper on the more remarkable oak trees in Essex (*Ibid.* VIII., 89), richly illustrated as it is by prints taken from photographs, must be regarded as a valuable contribution to Essex botany. Among other local records attention may be called to Mr. Arthur Lister's note in 1882 "On the occurrence of *Carex pseudo-cyperus* and the

flowering of *Lemna gibba* in Wanstead Park." (*Proc.* III., xlviii.), Mr. E. M. Holmes' notes on the occurrence of the rare moss, *Zygodon forsteri*, Mitten, in Epping Forest (*Ibid.* lxii.; from *Journ. of Botany* for Nov., 1882) and on a new British Alga (*Vaucheria sphœrospora*) found near Maldon (ESSEX NATURALIST, I., 151), Mr. Joseph Clarke's paper on some plants peculiar to Essex and on some plants of Saffron Walden and neighbourhood (*Ibid.* III., 274) and Mr. Robert Paulson's notes on the Carices of the Epping Forest area (*Ibid.* IV., 135).

Since in Gibson's *Flora of Essex* we have already a standard work on the Flora of the County, it may be considered that all the local lists and records scattered throughout our pages are additions and corrections to or emendations of statements in that well-known work. Looking through our pages one cannot but be struck with the large share of attention bestowed upon the cryptogamic plants of our County. This is, doubtless, due to the popularity of these plants as subjects of study and perhaps no less to the circumstance that from the very beginning of our career we have had the invaluable co-operation, advice and assistance of Dr. M. C. Cooke and other distinguished mycologists, while the unrivalled keenness as a collector of the late James English; of Epping, has helped to enrich our lists of Epping Forest species by many notable additions. The first "Preliminary List of the Hymenomycetal Fungi of Epping Forest," by Dr. Cooke and Mr. English appeared in 1881 (*Trans.* II., 181); Cooke's "Preliminary List of the Microscopic Fungi of Essex—Ustilaginei and Æcidiomycetes" in 1887 (ESSEX NATURALIST, I., 184); his list of Discomycetes in 1888 (*Ibid.* II., 189) and his catalogue of the Hymenomycetal Fungi of Epping Forest in 1889 (*Ibid.* III., 248). Since this last-named list hardly a year has passed without some additions being announced at our annual "Fungus-forays," the species observed at the foray of 1900 having formed the subject of a paper by Mr. G. Massee, and comprising two species new to Britain and several new to Essex (*Ibid.* XI., 313). A list of the Fresh-water Algæ of the Forest was communicated by Dr. Cooke in 1883 (*Proc.*, IV., xlvii.) and a complete preliminary catalogue of species recorded in Essex generally was published by the same author in the ESSEX NATURALIST in 1893 (VII., 170). The lichens of Epping Forest were catalogued in 1883 by the Rev. J. M. Crombie (*Trans.* IV., 54). In 1890 the annual

Fungus Foray in Hatfield Forest enabled Dr. Cooke and his coadjutors Messrs G. Massee and E. M. Holmes to publish preliminary lists of the Fungi, Mosses, Lichens and Liverworts of that hitherto unworked district, and to add some twenty-five species to the Essex Flora (ESSEX NATURALIST, IV., 219-221).

The late Mr. E. G. Varenne having left a rich herbarium of cryptogamic plants collected by himself over a period of forty years at and around Kelvedon, these were catalogued and a valuable paper published on the whole collection by Mr. Marquand in 1891 (ESSEX NATURALIST, V., 1-30). This list comprises a few coast species and Mr. E. M. Holmes has published in the same volume (*Loc. cit.* 263) a note on the marine algæ and flowering plants observed between Harwich and Dovercourt. A complete provisional list of the marine Algæ of Essex was drawn up and communicated to the Club three years later by Mr. E. A. L. Batters (*Ibid.* VIII., 1-25). In 1896 Mr. Arthur Lister gave an address on the Mycetozoa at our annual Fungus Foray in which he referred to the species observed in Epping Forest (*Ibid.* X., 23).

Our botanical labours have thus on the whole been of the nature of species recording--a branch of work which, as in zoology, it is most appropriate for a local society to undertake. Mr. Shenstone, who is writing the chapter on Botany for the *Victoria History of Essex*, informs me that his article is an epitome of the work of the Club. The wider problems of botany have not, however, been altogether neglected, and many of our experts have from time to time addressed our meetings on the general biology of certain groups. I may remind you that Prof. Boulger gave us his views concerning the evolution of fruits in 1881 (*Trans.* II., 1) and that he first published his suggestion concerning the adoption of the river-basins of Essex as natural history provinces in a paper read at a meeting of the Club the same year (*Trans.* II., 69). The following year this same author read his first paper on the history of Essex botany (*Proc.* III., vii.), the first part of which, dealing with the botanists of the sixteenth and seventeenth centuries, has now been completed, and three instalments have appeared in the ESSEX NATURALIST (XI,, 57, 169, 229). As a valuable contribution to economic botany Mr. Paulson's paper on the disease affecting the birch trees must be specially mentioned (ESSEX NATURALIST, XI., 273).

It is to be regretted that the contributions to plant-biology have not been more numerous, but there are many reasons telling against the prosecution of this kind of work by the members of local societies. It is a subject requiring close and constant application and is thus generally beyond the powers of the amateur botanist who is too busy with his ordinary occupations to attend to such work. The necessary experimental investigations also demand much skill and originality as well as a certain command of appliances which are not always available to the amateur. Expert botanists belonging to local societies who do work in this field generally publish their results through some central learned society, and so the botanical work of field clubs must necessarily be of the nature of species recording to a preponderating extent. I still think, however, that the suggestions made by Prof. Bayley Balfour at the Manchester Conference of Delegates of the Corresponding Societies of the British Association in 1887 concerning the study of life-histories should not be allowed to fall into oblivion in Essex (ESSEX NATURALIST, I., 200, 278). Among the few notes referable to botanical bionomics is that by Messrs. Rosling and Miller Christy in 1884 on the transmission of "form" in heterostyled plants (*Proc.* IV., cxxvii.) and Mr. Joseph Clarke's "Hint on the Vitality of Seeds" (*Ibid.*, cxxix.).

The remarks made under Zoology with reference to collecting apply with equal or even greater force to plants. The subject of plant preservation was specially discussed at our meeting on Oct. 31st, 1885, and a series of resolutions were passed by those present which it is to be hoped will be always considered as expressive of the policy of the Club throughout the future (*Proc.* IV., clxxviii.; ESSEX NATURALIST, II., 47, and report of Easton Lodge meeting, *Ibid.* X., 179).

III.—GEOLOGY, PALÆONTOLOGY, PHYSIOGRAPHY AND SEISMOLOGY.

In this department we may claim to have carried out our programme with marked success. I will venture to quote a passage from an advanced proof of the article on the Geology of Essex, written by Mr. Horace B. Woodward for the *Victoria History* of the County:—

"Our knowledge of Essex Geology, due chiefly to the labours of Prestwich, Searles V. Wood, jun., Prof. W. Boyd Dawkins and Mr. Whitaker, has been augmented by the workers of the Essex Field Club and of the Geologists' Association, and notably by Mr. T. V. Holmes."

We were fortunate at a very early stage in our career to have secured Mr. Holmes as a member and later as President; Mr. Whitaker was among our first Hon. Members, and the late Mr. Searles V. Wood has been a contributor to our publications. The first original observation in geology published by the Club was by Mr. W. H. Dalton in 1881 on the Blackwater Valley (*Trans.* II., 15) in which he made known as the result of a boring for an Artesian well at Tiptree Heath the apparent existence of a faulted undulation in the underlying chalk, which subject was further developed in a later paper by Mr. Dalton in 1890, entitled "The Undulations of the Chalk in Essex" and accompanied by a valuable map. In this paper the author dealt incidentally with the question of the existence of coal under Essex (ESSEX NATURALIST, V., 113). Among the early geological publications of the Club reference may be made to Mr. N. F. Robarts' "Notes on the London Clay and Bagshot Beds at Oakhill Quarry, Epping Forest" (*Trans.* III., 231) and Mr. Searles V. Wood's paper "On the Sand-pit at High Ongar" (*Ibid.* IV., 76) to which is appended a note by that author relating to Mr. Dalton's paper on the Tiptree Heath boring and suggesting instead of a faulted undulation a simple sinuosity in the fold of the underlying chalk (*Ibid.*, p. 85).

The deep geology of our County can of course only be studied by means of borings, and here again we have been fortunate in securing the co-operation of that most distinguished of all authorities on the geology of the London Basin, Mr. Whitaker, who has kept an ever watchful eye on the well-sections, some 326 of which he has recorded in a series of four papers published by the Club between 1885 and 1895 (*Trans.* IV., 149; ESSEX NATURALIST, III., 44; VI., 47; IX., 167). Mr. Whitaker informs me that since his last communication he has records of some six dozen other Essex well-sections ready for publication. The part taken by the Essex Field Club in developing the geological knowledge of this part of the country is also well brought out by Mr. Whitaker in his annual

presidential address to the Geologists' Association, delivered February 8th, 1901, under the title "Twelve years of London Geology" (*Proc. Geol. Assoc.*, XVII., 81). While dealing with Mr. Whitaker's contributions to our publications I may point out that in 1887, in a paper entitled "What is the use of the Essex Field Club?" (ESSEX NATURALIST, I., 180), he emphasized in his forcibly humorous style the necessity for the members of a local society such as this looking out for temporary sections exposed by railway cuttings, &c. In 1889 Mr. Whitaker, in conjunction with Mr. Dalton, contributed a most valuable bibliographical paper to the ESSEX NATURALIST (III., 61-86), viz., a "List of Works on the Geology, &c., of Essex," this list comprising the Geological Survey Publications, and books, papers, &c., chronologically arranged from 1701 down to 1888. In the same volume (p. 140) he sanctioned the publication of an abstract of a paper "On a Deep Channel of Drift in the Valley of the Cam, Essex" read at the Newcastle meeting of the British Association, and since published by the Geological Society (*Quar. Journ.*, 1890, p. 333; ESSEX NATURALIST, IV., 117).

The Rev. A. W. Rowe, who has since made notable contributions to geology, gave us in 1885 a paper on some crystalline rocks from the Drift in the neighbourhood of Felstead (*Proc.* IV., cxl.) which, after further elaboration, was published *in extenso* by the Geological Society (*Quar. Journ.*, Aug., 1887, pp. 351-363). A later contribution on Essex boulders was made by Mr. Rowe in 1887 (ESSEX NATURALIST, I., 117) in extension of a note on this subject by Mr. Worthington Smith (*Ibid.*, p. 8).

The contributions to Essex geology with which our publications have been enriched by the work of Mr. T. V. Holmes are so numerous and important that it is only possible to do justice to them by giving a special list:—

"On the Subsidence at Lexden, near Colchester, in 1862." ESSEX NAT., I., 1-8.

"Notes on Drift Maps, with special reference to those of Essex." *Ibid.* II., 21-32.

"The Subterranean Geology of South-Eastern England"; Presidential Address for 1888; *Ibid.* II., 138-158.

"Notes on the Geology of Maldon and the Blackwater Estuary"; *Ibid* III., 111-115.

"On some recent Subsidences near Stifford, Essex"; *Ibid.* 183-188.

"Chelmsford Water Supply"; *Ibid.* IV., 82-84.

"On some Sections between West Thurrock and Stifford on the Grays and Upminster Railway"; *Ibid* 143-149.

"The Geology and Scenery of the Club's Voyage from Maldon to Chelmsford, August 8th, 1891"; *Ibid.* V., 197-202.

"The Geology of the District around Dagenham Breach, Essex;" *Ibid.* VI., 142-146.

"The New Railway between Upminster and Romford. Boulder Clay beneath old River Gravel at Hornchurch. Conclusions therefrom"; *Ibid.* VII., 1-14.

"Notes on the Geology of the Neighbourhood of Chelmsford"; *Ibid.* 65-66.

"Coal under South-Eastern England." Reports by T. V. Holmes and W. Whitaker; *Ibid.* VIII., 142-150.

"The Geology of the Lea Valley"; *Ibid.* 198-201.

"Notes on the Geological Section at Chelmsford, in which Mammoth and other Remains were discovered in November, 1894"; *Ibid.* IX., 10-16.

"Notes on a Map including the greater part of South-Eastern England, recently issued by the Geological Survey"; *Ibid.* IX., 112-115.

"Discovery of Mammalian Remains at Great Yeldham, Essex," by T. V. Holmes and E. T. Newton; *Ibid.* 115-118.

"A Sketch of the Geology of Epping Forest"; *Ibid.* 160-165.

"Notes on the Ancient Physiography of South Essex"; *Ibid.* 193-200.

(*This paper is accompanied by a map shaded so as to represent elevations*).

"Coal under South-Eastern England; Reports by T. V. Holmes and W. Whitaker"; *Ibid.* 213-218, 253-255; X., 9-10, 136-139.

(*These papers on the search for Coal under Essex have been compiled by the Editor from the reports of Messrs. Holmes and Whitaker.*)

"The Geology of Ilford," from *Proc. Geol. Assoc.* (ESSEX NAT., XI., 149).

"Geological Notes on the New Reservoirs in the Valley of the Lea, near Walthamstow"; *Ibid.* XII., 1-16.

This list does not include the many short notes with which Mr. Holmes has supplied our Editor, nor does it adequately express the extent of his services to the Club by his numerous attendances at field meetings and his expositions of local geology on the spot. It must be borne in mind also that much of the work above catalogued has often necessitated frequent visits to the places where sections were exposed and constant supervision where excavations were in progress.

The vigilance of our local observers has also contributed much towards the success of this branch of our work. The Rev. O. Fisher sent a note in 1887 relating to the subsidence near Lexden in 1862, dealt with by Mr. Holmes in his paper above

referred to (ESSEX NATURALIST, I., 39). In 1899 Mr. Miller Christy published "Notes on an Alluvial Deposit in the Cann Valley, with a list of the Mollusca," to which notes were added by Mr. Dalton (*Ibid.* III., 1), and Mr. R. W. Christy a paper, "Notes on the Geology of the District around Chelmsford" which has already been referred to in connection with the lists of Mollusca (*Ibid.* III., 171). Mr. Dalton dealt with the Geology of Fowlness at our Southend meeting in 1889 (*Ibid.* III., 239) and the following year he published his "Notes of Geological Rambles in the Braintree District in connection with the Easter Excursion of the Club" (*Ibid.* IV., 79). As a contribution to local physiography the silting up of the River Roding, as reported upon by the County Surveyor, has been duly noted in our pages (*Ibid.* IV.,94).

Among recent workers in Essex geology Mr. H. W. Monckton must be mentioned as a contributor of valuable papers to the ESSEX NATURALIST. His first communication on the Boulder Clay in Essex was published in 1890 (ESSEX NATURALIST, IV., 199). At a field meeting on July 11th, 1891, he read "Notes on the Glacial Formation near Chelmsford" (*Ibid.* V., 191); in 1893 we published his "Geological Notes in the Neighbourhood of Ongar" (*Ibid.* VII., 87) and the same year his paper read at the Barking Side meeting on July 1st "On the Gravels near Barking Side, Wanstead, and Walthamstow" (*Ibid.*, 115). We have also reaped the benefit of the presence of that zealous worker at Felstead, Mr. J. French, who in 1891 called attention to the occurrence of Westleton Beds in North-west Essex (*Ibid.* V., 210), and in 1892 contributed a paper "On some Plateau Deposits at Felstead and Stebbing" in which he discusses some interesting points in Post-Glacial Geology (*Ibid.* VI., 132). Our late member, Mr. T. Hay Wilson, also has given us the benefit of his local vigilance. In 1893 he published his notes on the gravels of Epping Forest, being the result of his observations of sections at Copt Hall, High Beach, Chingford and Buckhurst Hill (*Ibid.* VII., 74), and four years later he gave us a note on sections in the Lea Valley exposed at South Tottenham during the construction of the new reservoirs (*Ibid.* X., 110). The question of the occurrence of coal under Essex has, on account of its possible economic bearings, naturally engaged considerable attention and given rise to much controversial writing. The Rev. A. Irving published a newspaper

article on this subject in 1894, which was reprinted in the ESSEX NATURALIST (VIII., 130), and Mr. Dalton's paper of 1890 and the reports by Messrs. Holmes and Whitaker have already been referred to. As a contribution to economic geology Dr. Thresh's paper on the shallow and deep well-waters of Essex, accompanied as it is by tables of analyses of the waters, is one of the highest value (*Ibid.* VII., 28-40). In his recent work, *Report on the Water Supply of the County of Essex*, of which a notice by Mr. Dalton appears in the ESSEX NATURALIST (XII., 62), Dr. Thresh repeatedly acknowledges his indebtedness to our publications. Mr. T. S. Dymond's interesting note and analysis of the manganiferous conglomerate found at Tendring (*Ibid.* X., 210) was, until Miss Thresh's recent paper on the same subject, our only original contribution to mineralogical geology. Mr. Percy Clark's paper on the encroaching sea on the east coast is a record of the effects of the high tide of Nov. 29th, 1897 (*Ibid.* X., 297). Mr. Monckton's criticism of the official report by Mr. Hunter Pringle on the land that had gone out of cultivation in Essex (*Ibid.* IX., 70) may be regarded as a contribution to economic geology.

Palæontology and stratigraphy are necessarily treated of together in many of the communications which we have received and published. Some of the papers on the Mollusca of Essex catalogued under Zoology belong to both divisions. The popular lecture on "A Day's Elephant-hunting in Essex," by the late Henry Walker (*Trans.* I., 27), was the first paper published by the Club after the Inaugural Address. Later, in 1882, Dr. Henry Woodward, F.R.S., gave us an admirable lecture on "The Ancient Fauna of Essex" to which he appended a list of the Mammals from Ilford collected by Sir Antonio Brady and now in the British Museum of Natural History (*Trans.* III., 1-29). The services rendered by our Hon. Member, Mr. E. T. Newton, F.R.S., in connection with our palæontological work have been acknowledged from time to time in our pages, and it may be generally said that every important find of vertebrate remains in Essex has had the advantage of being submitted to his critical knowledge. Although Mr. Newton's contributions to our work have not often taken the form of separate publications, they are none the less valuable, and any record of our past achievements would be incomplete without some acknowledgment of the part he has taken therein. A paper by him on the

Pleistocene Mammals from the neighbourhood of Chelmsford was published in 1895 (ESSEX NATURALIST, IX., 16). The eleventh volume of the ESSEX NATURALIST for 1899-1900 is quite remarkable for a number of geological papers comprising palæontological contributions. Taking these in order we have :

"Some New Sections in, and contributions to, the Fauna of the River Drift of the Uphall Estate, Ilford, Essex," by J. P. Johnson and G. White, ESSEX NAT., XI. ; 157.

"On the Pleistocene Deposits of the Ilford and Wanstead District," by Martin A. C. Hinton ; *Ibid.*, 161.

"Additions to the Palæolithic Fauna of the Uphall Brickyard, Ilford," by J. P. Johnson ; *Ibid.*, 209 ; also XII., 52.

(This paper is noteworthy as containing a record of the discovery of flint implements in the Uphall series of deposits associated with extinct species of animals).

"The Eocene Flora and Fauna of Walton-Naze, Essex," by J. P. Johnson ; *Ibid.*, 284.

"Contributions to the Pleistocene Geology of the Thames Valley, I., The Grays Thurrock Area, Part I.," by Martin A. C. Hinton and A. S. Kennard. With a Sub-Section on the Fossil Fishes, by E. T. Newton ; *Ibid.*, 336-370.

This last paper is certainly a most important contribution to Essex Geology, being the result of field work and personal observation. It comprises also a very valuable bibliographical list of 75 references, among which it is gratifying to find several references to work published in our pages. The second part of this paper was read at a recent meeting of the Club, and is of equal or even greater interest as a contribution to ancient physiography. It is hoped that this part will shortly appear in the ESSEX NATURALIST.

Seismology is a subject which, happily for this country, does not often force itself in its most obtrusive form upon the attention of our local Societies. We had our big earthquake, however, on April 22nd, 1884, and on Feb. 28th, 1885, I presented to the Club the detailed report on this occurrence prepared by myself and Mr. William White (*Proc.*, IV., cxxxvii). The volume was published the same year as the first of our *Special Memoirs*, and in fact inaugurated the system of Special Memoirs. Of course it is not for me to say anything about the value of this work, but it was undertaken in fact by way of example in order to emphasize the duty of local societies in

scientifically recording such uncommon phenomena when they occurred. From this point of view it was well received by the scientific public and by the Press, and at the time of its publication was the only complete monograph of a British earthquake. The Herefordshire earthquake of Dec. 17th, 1896, was also felt in our County (ESSEX NATURALIST, IX., 258; X., 240) and formed the subject of an excellent monograph by Dr. C. Davison published in 1899 by the aid of a grant from the Royal Society. This memoir is cast on very much the same lines as our Report, but is worked out much more exhaustively, the author coming to the same conclusion respecting the origin of the earthquake that we had arrived at concerning the Essex earthquake, viz., that it may have been connected with the process of "faulting" in the geological sense. It is of interest to note also that Dr. Davison estimates that in "concentrated severity the Essex earthquake far exceeded the Hereford earthquake," although the total area disturbed was greater in the case of the latter.[3]

IV.—ANTHROPOLOGY.

At the beginning of the Club's existence we decided to restrict our actual work in the domain of archæology to the study of that period which, although perhaps not definable within any rigid limits, is known generally as the pre-historic or non-historic (Inaugural Address, *Trans.* I., 18). The later archæology had been and still is well looked after by the Essex Archæological Society, and although we have generally made a point of visiting places of archæological interest in the course of our field-meetings we have not laid ourselves out for the publication of detailed archæological papers. Some small amount of unavoidable overlap may have occurred, but I do not think that we have encroached very seriously upon our neighbour's domain. It has been and will I hope always continue to be the policy of the Club to treat archæology rather in its scientific aspect as a branch of the modern science of anthropology.

With respect to pre-historic archæology we may take credit for having made substantial contributions during the past twenty-one years. The chapters on the archæology of Essex for the *Victoria History* of the County which have been written

[3] *The Hereford Earthquake of December 17th*, 1896. By Charles Davison, Sc.D., F.G.S., Birmingham, Cornish Bros., 1899. p. 224.

by our members, Messrs. G. F. Beaumont and I. C. Gould, and of which I have been favoured with an advanced copy, bear ample testimony to our activity. We were very fortunate at the outset in having secured the active interest of that great pioneer in modern archæological research, our late Hon. Member, Gen. Pitt-Rivers. It was at his instigation that systematic excavations into the Epping Forest earthworks were first undertaken, the suggestion having been brought before the Club at a meeting held on July 3rd, 1880 (*Proc.* I., xxiv.) and at another memorable meeting held at Ilford on July 24th, 1880 (*Ibid.*, xxxii.; see also pp. l. and liv.). The report on the excavations at Ambresbury Banks was drawn up by Gen. Pitt-Rivers and read in 1881 (*Trans.*, II., 55; see also *Proc.* II., xxviii., for official report and bibliographical history by the Secretary, Mr. W. Cole). The exploration of the Loughton Camp was taken in hand the following year, the British Association having recognized our work by appointing a Committee and making a grant in aid of the expense of excavation. The full report, drawn up by our Secretary, was presented by me on our behalf at the Southport meeting of the Association, and was also read before the Club on Sept. 29th, 1883 (*B. A. Rep.*, 1883 pp., 243-252; *Trans.* III., 212; *Proc.* III., li., and Appendix No. 2, p. vi.). The conclusions to which this, our first piece of archæological exploration, has led, are too well-known to need recapitulation. It may be desirable to point out, however, that although we have replaced antiquarian lore by more substantial information, there still remains much to be done, even in connection with these "camps." More especially may I emphasize the necessity for cutting further sections through and across Ambresbury Banks, since the evidence as to the age of this earthwork, although conclusive as far as it went, was derived from one section only.

One other piece of archæological research which we have made essentially our own is the exploration of the "Dene-holes" in Hangman's Wood near Grays. These interesting excavations were first brought prominently under the notice of the Club by Mr. Worthington Smith at a joint meeting held with the Geologists' Association at Grays, on May 14th, 1881 (*Proc.* II., xviii.) Both the conductors of that remarkable meeting, Prof. John Morris and Mr. Henry Walker, were Hon. Members of the Club, and Mr. Worthington Smith, whose name still graces —and may it long continue to grace—our list, has since helped

to make the publications of the Club famous in the annals of pre-historic archæology. The curiosity aroused by our first visit to the dene-holes led to further visits by the Club on June 17th and Sept. 9th, 1882 (*Proc.* III., xxviii., lviii.), the outcome of these meetings being a paper by Mr. T. V. Holmes (*Trans.* III., 48) and a very full bibliographical history of the subject by our Hon. Secretary, Mr. W. Cole (*Proc.* III., xxviii—xxxiv). The raising of a fund for the systematic exploration of these remains was suggested at our meeting on Oct. 28th, 1882 (*Ibid.* LXXXIV.); there were further visits to Hangman's Wood by the Club and the Geologists' Association on June 15th and 16th, 1883 (*Proc.* IV., xx.) and Mr. T. V. Holmes as the result of this further inspection published his "Miscellaneous Notes on Dene-holes" in our *Transactions* for that year (IV., 87). A committee of exploration was appointed by our Council on March 31st, 1883, and a sufficient fund raised to enable Mr. Holmes and Mr. W. Cole, to whom had been entrusted the practical work of superintending the excavation, to commence operations in October of that year (*Proc.* IV.,cxxiii.) The work was discontinued on Nov. 10th, and the results withheld till further evidence had been obtained, for which purpose work was resumed by Mr. Holmes and Mr. W. Cole and his brothers on Sept. 26th, 1887, and continued till October 10th of that year (ESSEX NATURALIST I., 202). The full report was drawn up by Mr. Holmes, read on Nov. 12th, 1887, and published shortly afterwards (ESSEX NATURALIST I., 225). This report may fairly claim to embody all that is authentically known concerning these mysterious remains down to the present time, and if, owing to the absence of positive evidence, the problem of their age and purpose has not been finally solved, we have the satisfaction of knowing that we have at least advanced the knowledge of the subject by a very marked step, and that such conclusions as have been arrived at by Mr. Holmes and his colleagues are based upon the solid ground of scientific evidence. One valuable feature of the report is the series of papers contributed in the form of appendices by Messrs. E. T. Newton, F. W. Rudler, F. J. Bennett, H. B. Woodward and F. C. J. Spurrell. It is probably within the recollection of most of those present that the dene-holes have been visited by the Club several times since the issue of the report, but no fresh discoveries of note have been made and the matter rests where it was left by our reporters

fifteen years ago. Possibly the renewal of this investigation may be undertaken at some future period by the Club.

In the annual presidential address which I had the honour of delivering on Jan. 27th, 1883 (*Trans.* III., 62), I ventured to put forward the suggestion that we should undertake to prepare a complete catalogue of the pre-historic remains of our County. This suggestion was further elaborated and read at the Southport meeting of the British Association the same year (*Trans.* IV., 116), and our Hon. Secretary, Mr. Cole, commenced to collect materials for such a catalogue. Owing to pressure of other work but little progress has been made by the Club in this matter, and in the meantime the Society of Antiquaries has set the scheme practically going by inaugurating a system of registration of ancient remains on the existing Ordnance Maps (ESSEX NATURALIST, III., 91). The necessity for carrying out systematic archæological surveys of the Counties was quite recently brought before us by Mr. C. H. Read, and that is why I have ventured to refer to it again. The modern publication of the *Victoria County Histories* has also been the means of emphasizing the necessity for archæological surveys, and our own County has been undertaken for this work by our Members, Messrs. G. F. Beaumont and I. C. Gould, who have prepared two maps registering respectively by means of symbols the remains of the stone, bronze and iron ages, and the ancient earthworks, camps, mounds, tumuli, &c. The Roman and later remains will also be dealt with, but these do not come within our province. Large numbers of the records entered by the authors above mentioned are taken from our pages and these will serve as vouchers for our utility in connection with pre-historic archæology.

I have already referred to our indebtedness to Mr. Worthington Smith. We have had the benefit of his co-operation as mycologist and archæologist as well as in his capacity of artist and engraver. The first of his series of papers on "Primæval Man in the Valley of the Lea" was read in 1882 and revised for publication in 1883 (*Trans.* III., 102) and followed by three communications on the same subject in 1887 (ESSEX NATURALIST, I., 36, 83, 125). All these papers are profusely illustrated by the author's own engravings of implements, &c. Other papers from his pen, and also illustrated by his pencil, "On Neolithic and Palæolithic Scrapers, replaced and reworked" and on "Palæo-

lithic Implements—large and heavy examples" were published in 1888 (*Ibid.* II., 67, 97). In the same volume (p. 4) appear his figure and description of the stone "pestle" from Epping Forest. In 1898 he described and figured an implement made from a stag's antler found at Wormingford (*Ibid.* X., 310), this paper having called forth a communication on the same subject by Mr. Edward Lovett (*Ibid.* 351). Those who wish to form an appreciation of Mr. Worthington Smith from his humorous side will do well to peruse his "Lepores Palæolithici," read in 1884 and published in 1888 (ESSEX NATURALIST II., 7). Among other relics of early human workmanship referred to in our publications attention may be called to Mr. H. Corder's paper on "Stone Implements from the Neighbourhood of Chelmsford" (*Trans.* II., 29), the paper on two pre-historic weapons from near Epping (ESSEX NATURALIST VIII., 162), Mr. Mothersole's "Notes on some Relics of early Man in the Neighbourhood of Chelmsford" (*Ibid.* X., 305) and Mr. J. P. Johnson's paper on "Palæolithic Implements from tho low-level Drift of the Thames Valley, chiefly from Ilford and Grays" (*Ibid* XII., 52), this last paper having been already referred to under our palæontological contributions. Mr. Laver's note on the discovery of Celtic urns at Colchester (ESSEX NATURALIST III., 116) brings us down to a later period.

The human skeleton found during the excavations at the Tilbury Docks, formed the subject of a paper read before the Royal Society by Sir Richard Owen in 1883, and afterwards published as a separate work (Van Voorst, August, 1884). The distinguished author, who was one of our Hon. Members, had come to the conclusion that this skeleton was of Palæolithic age, but at a meeting of the Club held on February 23rd, 1884, Mr. T. V. Holmes and others expressed their belief that the evidence of extreme antiquity was unsatisfactory (*Proc.* IV., lxxviii.) and a meeting of the Club, in conjunction with the Geologists' Association, was held at Tilbury on May 17th of the same year (*Ibid* xcviii.) In a paper by Mr. Holmes, published by us in 1884 (*Trans.* IV., 135), the "antiquissimist" view (to use Mr. Spurrell's expression) of the skeleton was disposed of. The value of geological judgment in connection with archæological reasoning is well brought out in other papers communicated to Club, such as Mr. Goodchild's "Notes upon some Mounds near the Estuary of the Thames" (ESSEX NATURALIST I., 210) and

Mr. Holmes' "Geological Notes on a supposed Earthwork near the Railway Station at Harlow" (*Ibid.* IX., 59) which led to a friendly controversy with Mr. I. C. Gould (*Ibid.*, 65 and reply p. 68).

Many other contributions to the records of the existence of early man in Essex appear in our pages. In 1891 Mr. J. French called attention to the existence of ancient lake remains at Felstead and in the neighbourhood (ESSEX NATURALIST VI., 34), and the Rev. J. W. Kenworthy gave us in 1899 his most interesting paper on "A Supposed Neolithic Settlement at Skitt's Hill, Braintree," the value of which is enhanced by Mr. Reader's remarks on the archæological remains, Mr. Holmes' notes on the geology of the district and Mr. Newton's remarks on the osteological specimens (*Ibid.* XI., 94—126). The notes by Mr. Holmes on the ancient cemetery at Saffron Walden (*Proc.* IV., cc.) bring us down again to a later period in human history. The mysterious "Red Hills" or "Salting Mounds" so numerous about the estuaries of the Essex rivers were referred to at a meeting held at Colchester and Mersea in 1884 (*Proc.* IV., cxiii.) and a paper on these remains was published by Mr. Stopes in 1887 (read in 1884; ESSEX NATURALIST I., 96). Our Hon. Secretary, Mr. W. Cole, is among those who have given latest attention to the subject, having explored several of these mounds, and has come to the conclusion that they may have been the sites of ancient potteries. This view is most probable, but the final answer to the questions as to their age and object can only be solved by further systematic excavation, and, as Mr. C. H. Read urged in his recent address, it is to be hoped that this work will be undertaken by the Club.

A glance at the map indicating the distribution of ancient earthworks throughout Essex will show that we have visited many, published good accounts of some, and explored none with the exception of the two Epping Forest camps above referred to. Four "camps" are described in great detail in the ESSEX NATURALIST, viz., Withambury by Mr. F. C. J. Spurrell (I., 19), Danbury by the same author (IV., 138), Hæsten's Camp at Shoebury by the same author (IV., 150) and the Uphall Camp, Barking, by Mr. Walter Crouch (VII., 131). In 1897 Mr. T. V. Holmes communicated his "Notes on Ancient Defensive Earthworks in connection with those of Rayleigh 'Castle,' Essex"

(*Ibid.* X., 145). These papers, all useful in their way, may be considered as dealing with the external morphology of earthworks; Mr. Holmes take us a step further and deals with their comparative morphology. But there still remains before us for future work the systematic excavation of these relics of past ages, and by this method alone can we ever hope to unravel the mystery of their origin. The necessity for this work is as pressing now as when I brought it before the Club in 1883 (*Trans.* IV., 116) as there is always the danger of their removal by agricultural and building operations. That this is a real danger from the anthropological point of view may be gathered from the account given by Mr. Holmes in his presidential address of 1887 (ESSEX NATURALIST I., 79) in which he describes the destruction of the "Pictsbury Ramparts" witnessed by himself and Mr. Cole. A large mound at Wormingford was destroyed about 1836 (Jenkins, as quoted in ESSEX NATURALIST I., 82); Stukeley's so-called "Alate Temple of the Druids" on Navestock Common, the site of which was identified by the Rev. Coode Hore and myself in 1894 (ESSEX NATURALIST VIII, 213) has practically been obliterated; the "Red Hills" have in nearly every case been ploughed down or otherwise tampered with, and the Uphall Camp at Barking described by Mr. Crouch is but a fragment of a large camp. I am glad to learn that there is a prospect of this remnant being systematically investigated in the course of this present year.

The field covered by anthropology is so wide that large numbers of apparently disconnected subjects dealt with by our Society can be fairly classified under this heading. Thus the presidential address by Mr. T. V. Holmes entitled "Notes on the evidence bearing upon British Ethnology" (*Trans.* IV., 189) and Mr. F. Chancellor's presidential address in 1894, "A Sketch of the Development of Architecture in Essex" (ESSEX NATURALIST VIII., 165), which deals with the subject from an evolutional point of view, are both contributions to anthropology. In the same volume (p. 71) is published Mr. George Day's "Notes on Essex Dialect and Folklore, with some account of the Divining-Rod," the only contribution to Essex Folk-lore that we have hitherto received. Mr. Laver's presidential address of 1888, "Fifty Years Ago in Essex" (*Ibid.* III., 27) contains records of old customs and beliefs that may be regarded as anthropological contributions. In fact all notices of ancient

sports, customs, beliefs and industries are worthy of record from the anthropological point of view and many such contributions have appeared in our pages. I give a selection of the more prominent communications :—

Mr. Joseph Clarke's paper in 1887 on the Saffron Plant in connection with the name of Saffron Walden (ESSEX NATURALIST I., 5) relates to an extinct industry. Mr. Harting's paper on "Wild-fowl Decoys in Essex" relates to a sport and an industry which is in its last stage in this country. An ancient sport is dealt with in Mr. Harting's paper on "Hawks and Hounds in Essex in the Olden Time" (*Ibid.* III., 189) while the "Maze" at Saffron Walden described by Mr. G. N. Maynard in 1889 (*Ibid.* 244), is of unknown origin and purpose. In ancient histories of Essex many of the towns are described as being celebrated for "Bays and Says." References to this extinct manufacture are given by Major Bale for Colchester (*Ibid.* VI., 141) and the old "Bay and Say" mill at Dedham visited by the Club in 1893 is figured in the account of that meeting (*Ibid.* VII., 111.) Accounts of extinct industries are contained also in Mr. Laver's paper on "Potash-making in Essex" (*Ibid.* IX., 119), in Mr. Lovett's papers on wooden fish-hooks (*Ibid.* X., 300; XII., 28) which relate to the survival of an ancient industry, in Mr. Miller Christy's paper on "Essex as a Wine-producing County" (*Ibid.* XI., 34) and in Mr. Littler's "Notes on the Hand-printing Silk Works at Waltham Abbey and West Ham" brought under our notice last year (*Ibid.* XII., 43).

V.—METEOROLOGY.

Although weather reports have from time to time been recorded in our pages the Club has never attempted systematic observations. In view of the activity and efficiency of such central organizations as those established by the late Mr. G. J. Symons and by the Meteorological Office it may fairly be doubted whether local societies should be called upon to burden the pages of their journals and to incur the expense of printing long tables of readings of meteorological instruments. The most useful work that such societies can do in connection with this subject would rather appear to be the stimulation of local observers and the establishment of local stations where required for the purpose of supplying records to the central organization. An excellent address having this object in view was delivered at

a meeting of the Club in May, 1888, by Mr. Symons (ESSEX NATURALIST II., 88) who, on that occasion, dwelt more especially upon rainfall observation. A paper on "The use of the Hygro-Spectroscope" was read before the Club in 1883 by Mr. F. W. Cory (*Trans.* IV., 123). On the other hand exceptional meteorological phenomena—and more particularly those which may be considered as having any direct influence upon physiographical conditions—should always be fully recorded, and in this respect it will be found that we have not failed whenever our County has been subjected to such visitations. Thus the great flood of August, 1888, was fully recorded by Mr. Radford Sharpe (*Ibid.* II., 199); the prolonged frost of 1890-91 formed the subject of papers by Dr. Thresh (*Ibid.* V., 64), Mr. French (*Ibid.*, 66) and Mr. Harding (*Ibid.*, 117). Mr. French also has written on the seasons of 1893 (*Ibid.* VII., 188). An account of the great storm of June 24th, 1897, was compiled by our Editor from materials supplied by Mr. Symons and others (*Ibid.* X., 112). The high tide of Nov. 29th of the same year also formed the subject of an editorial compilation and of the paper by Mr. Percy Clark already referred to under geology (*Ibid.* X., 277, 355). The results of the investigations of the effects of this tide upon the soil of the inundated lands by Messrs. Dymond and Hughes were duly noted in our pages (*Ibid.* XI., 83). Records of brilliant meteors were also noted in 1890 (*Ibid.* IV., 231) and 1894 (*Ibid.* VIII., 158). The evidence that the supposed earthquake shock of November 20th, 1887 (*Ibid.* I., 277) was due to the explosion of a meteorite was summarised from Mr. Fordham's observations and published in 1891 (*Ibid.* V., 44, from *Trans. Herts. Nat. Hist. Soc.* IV., 33-62).

VI.—EDUCATIONAL WORK.

In a broad sense the whole work of a local society may be regarded as educational inasmuch as any organization for bringing scientific activity to a focus must be regarded as a power making for general intellectual enlightenment. In many ways during the twenty-one years of our existence have we made the influence of the Club felt as an educational body. Many lectures, addresses and demonstrations in the field or in museums have been given which could not fairly be described as direct contributions to local scientific investigation, but which might be considered as pioneering efforts having for their object the

stimulation of original local work in various branches of natural science. Such lectures and addresses, although in many cases delivered by acknowledged masters of the various subjects, could not very well be published *in extenso* by the Club, and so the records of this branch of our work do not figure very prominently in our printed pages. Nevertheless this work is in its way both useful and important, provided it is kept in abeyance as a secondary branch and not allowed, as is the case with many local societies, to become the main object of the Club's existence. A long course of experience in connection with the working of local societies throughout the United Kingdom, derived from my association with the Corresponding Societies' Committee of the British Association, has served to convince me that the work of a local society is weak in proportion as it has to depend upon popular lectures for keeping it alive.

Quite early in the history of the Club educational work of this kind was undertaken and the system of popular lecturing inaugurated by a lecture by Mr. Harting on Nov. 10th, 1880, on Forest Animals (*Trans.* I., 74). The second lecture in this series on January 4th, 1881, was a memorable one, as Mr. Alfred Russel Wallace, our distinguished Hon. Member, gave an abstract of the main conclusions at which he had arrived concerning insular faunas and floras (*Proc.* I., lxvi.), the subject of the great work, afterwards published under the title *Island Life*. Again, on October 2nd, 1886 (*Proc.* IV., cxcii.) my friend, Mr. Wallace, favoured the Club with an advanced chapter of his work on *Darwinism*, then in course of preparation. But time will not admit of a detailed list of lectures, addresses and demonstrations given before the Club at headquarters or elsewhere. I need only justify this branch of our work by reminding you that we have had the privilege of hearing in this capacity Sir Richard Owen, Gen. Pitt-Rivers, Sir Wm. Flower, Dr. Henry Woodward, Mr. F. W. Rudler, Prof. E. B. Poulton (whose recent appearance on February 22nd, 1902, was his third lecture to the Club), Mr. Arthur Lister, Dr. M. C. Cooke, Mr. G. Massee, Mr. D. J. Cunningham ("Transformations of Marine Animals," ESSEX NATURALIST VII., 182), Prof. Charles Stewart, Mr. Frederick Enock and others. Perhaps also the address on "The Mechanical Questions involved in the Flight of Birds," delivered by Lord Rayleigh on the occasion of the Club's visit to Terling Place in 1885 (*Proc.* IV., clxxiii.) may be

looked upon as belonging to this category. I find also that I have myself contributed on some occasions to this kind of work.

In yet another direction has the Club been enabled to assist in the work of education. The Technical Instruction movement set going under the Acts of 1889 and 1890 led the Council of the Club to come forward in 1890 with a scheme which was submitted to the Essex County Council (ESSEX NATURALIST IV., 259) and supported by a deputation invited to wait upon the Technical Instruction Committee on Feb. 2nd, 1891 (*Ibid.* V., 34). The deputation comprised, among others, our Hon. Members, Sir Henry Roscoe, one of the chief promoters in Parliament of the Acts in question, and Sir William Flower. The final outcome of our application was the co-opting of six representatives of the Club as Members of the Technical Instruction Committee, the gentlemen proposed and accepted being Sir Henry Roscoe, Mr. G. J. Symons, Mr. F. Chancellor, Mr. J. C. Shenstone, Mr. John Spiller and myself. The later history of our connection with technical education in Essex was related by Mr. Chancellor in his presidential address for 1895 (*Ibid.* IX., 30), and to this I must refer you for details. It would not be fitting for me to attempt to weigh our utility or to form any estimate of our services to our colleagues of the Technical Instruction Committee. It was extremely difficult for us in the first stages of the movement to find men with the necessary educational qualifications and willing to give their time to the very exacting duties associated with the launch of a scheme so totally new to the people of this country. Changes in the Club's representation have been made from time to time, but of the original list Mr. Chancellor, Mr. Shenstone, Mr. Spiller and myself still remain as members of the Committee. If I may for once venture upon a personal statement I should like to place upon record my own sense of obligation to the Technical Instruction Committee for having given me the opportunity of studying the practical working of the Acts in Essex during the last decade.

VII.—MUSEUM WORK.

The idea of having a museum associated with the Club has, as you are aware, been present from the beginning of our existence. "The formation of a Museum" was contemplated in the original Rules and its general scope defined in my "Inaugural Address" (*Trans.* I., 12—13). The nature of the contents of

local museums was again brought before the Club by Mr. Harting in 1881 (*Trans.* II., 36; also *Proc.* II., xxii.) and we have since had many contributions from other authorities on this subject. I may refer you to the "Introductory Remarks to the Papers on the Museum and Technical Instruction Schemes" prepared when the establishment of our Museum at Chelmsford was contemplated in 1890 (ESSEX NATURALIST IV., 234) and to the reprints of valuable papers on local museums by Mr. Rudler and Prof. Traill (*Ibid.* 242, 252). We may I think flatter ourselves that the original programme so far as concerns the nature of our collections has been faithfully adhered to. That such museums, when properly stocked and arranged, are of great educational value has long been recognized by all who have given attention to the subject, and Sir Wm. Flower addressed the Club on this point at a meeting held at Chelmsford in 1891 (*Ibid.* V., 71). We have certainly—thanks to the wise policy adopted by our Curator—kept the contents of our museums well within the prescribed limits and have avoided the temptation of converting them into old curiosity shops, a danger foreseen at the outset and evidently familiar to all who have had opportunities of seeing many provincial museums. It may be of interest to quote in this connection a letter from the late Prof. Huxley referring to a scheme for a museum in Manchester which he had been requested to draw up:—

"I have no hesitation whatever in expressing the opinion that, except in the case of large and wealthy towns (and even in their case primarily) a Local Museum should be exactly what its name implies, viz., 'local'—illustrating local Geology, local Botany, local Zoology and local Archæology.

"Such a Museum, if residents who are interested in these sciences take proper pains, may be brought to a great degree of perfection and be unique of its kind. It will tell both natives and strangers exactly what they want to know, and possess great scientific interest and importance. Whereas the ordinary lumber-room of clubs from New Zealand, Hindoo idols, shark's teeth, mangy monkeys, scorpions and conch shells—who shall describe the weary inutility of it? It is really worse than nothing, because it leads the unwary to look for the objects of science elsewhere than under their noses." - *Life and Letters*, vol. I., p. 136.

The history of our own museums requires but very brief recapitulation. The first attempt to establish a Forest Museum dates from 1883, when, at the suggestion of Mr. Cole, a meeting was held at Knighton in order to confer with Mr. Edward North Buxton, with the object of ascertaining whether Queen Elizabeth's

Lodge, at Chingford, would be available for this purpose (*Proc.* IV., lxvi.) Eleven years elapsed before another effort was made and the meeting held at Chingford, on Feb. 24th, 1894 (ESSEX NATURALIST VIII., 44), may be said to have inaugurated the present state of affairs as regards the Chingford Museum which was formally opened on Nov. 2nd, 1895, by Mr. Deputy Halse, Chairman of the Epping Forest Committee of the Corporation of London (*Ibid.* IX., 101). The later restoration of the Lodge and the re-arrangement of the museum bring us down to recent history, and I need only add that the Club is greatly indebted to Mr. Cole on the one hand for all the labour and trouble which he has taken, and on the other hand to the Epping Forest Committee, and especially to Mr. E. N. Buxton for the sympathetic response with which our efforts to establish this museum have been met by the Corporation of London.

The vicissitudes of the central (County) museum are also too well known to require more than a passing reference. The first announcement of Mr. Passmore Edwards' munificent offer to build the museum, which now houses our collections and library was made by the Secretary at the meeting on Nov. 27th, 1897 (ESSEX NATURALIST X., 231), and the foundation-stone was laid by Mr. Passmore Edwards on Oct. 6th, 1898 (*Ibid.*, 340). The subsequent history is traced and the agreement with the West Ham Corporation given in the same volume (p. 337) and further details concerning the history of the Museum and its collections are printed in our series of *Museum Handbooks* (*No.* 3; Oct., 1900). After a nomadic existence of nearly twenty years the Club has at length found its present home, and the future stability of the museum is assured by its association with the Municipal Technical Institute in which we are now assembled. The advantages arising from that association and the part played by the Museum in the work of the Club were forcibly dwelt upon by the Countess of Warwick in her address delivered at the opening ceremony on Oct. 18th, 1900 (ESSEX NATURALIST XI., 323).

One result of the establishments of our two museums has been the issue of another set of publications, the series of *Museum Handbooks*, one of which has been referred to above. It will be admitted that these pamphlets are most useful as popular guides to the various groups of objects contained in our collections, and

the Club is much indebted to those who have contributed to the series :—

1. *General Account of the Epping Forest Museum, with a Description of Queen Elizabeth's Lodge.* By W. Cole (in preparation).

2. *Notes on the Romano-British Settlement at Chigwell, Essex, with a Description of the Articles exhibited in the Epping Forest Museum.* By I. Chalkley Gould.

3. *The Essex Museum of Natural History. A Short Statement of the Constitution, Aims and Methods of the Museum.* By W. Cole.

4. *A Brief Sketch of the Crag Formation of East Anglia. An outline of the nature, position, &c., of the beds which have furnished the collection of Crag Fossils in the Essex Museum of Natural History.* By W. H. Dalton.

5. *A Handbook to the Collection of Pre-historic Objects in the Essex Museum of Natural History.* By F. W. Reader.

Although I have undertaken in this address to give an account of work actually accomplished rather than attempt to point out the future needs of the Club, I cannot refrain from drawing attention briefly to the requirements of our museums. Although the collections brought together by the unflagging zeal of our Curator and the generous contributions of our members and friends may be fairly described as both rich in material and most thoroughly appropriate, there still remains very much to be done to bring the museums up to that standard of excellence which the past record of the Club leads us to look for. There is still scope for that organised and co-operative system of collecting which I advocated in 1880 (*Trans.* I., 20) in order to help fill the gaps yet existing in our series. Still more may we plead for the means to enable us to classify and arrange the collections with the greatest effect, for which purpose more cabinets and fittings are required for both and especially for the Epping Forest Museum, the re-equipment of which has been made incumbent upon us by the recent restoration of the building.

VIII.—THE CLUB IN ITS RELATIONS TO EPPING FOREST.

Established as we were in the year 1880 in the Forest District, and about the period when that splendid tract of country had been rescued from the hands of its depredators by the public spirit of the Corporation of London, it is but natural that we should have taken, as in fact it was our duty as a body of naturalists to take, the greatest interest in its welfare. Looking back to the history of our connection with

the Forest in our collective capacity as a scientific organization we may, I think, feel satisfied that our influence has made itself felt on many occasions for the benefit of the Forest and its frequenters. Sometimes we may have found it our duty to take side against the Conservators; at other times to support their policy with equal vigour. Whatever action we may have taken has been solely in the best interests of the Forest as far as knowledge and judgment could lead us. On the whole I venture to think that such action as we have from time to time felt called upon to take has resulted in nothing but good from the naturalists' point of view. I may remind you that very early in our career we felt bound to organize an opposition to a projected railway extension across the Forest by the Great Eastern Railway Co., and a resolution of the Council of Jan. 8th, 1881, was brought before the Club on Jan. 22nd (*Proc.* I., lxvii.). On Feb. 4th deputations from the Club and other Societies waited upon the Metropolitan Board of Works and the Epping Forest Clauses of the Bill were ultimately withdrawn (*Ibid.* II., v.) Again, in 1881, the proposed extension of the tram-line along the "Ranger's Road" was opposed by the Club (*Ibid.* lxxxiv.) and that Bill was also withdrawn (*Ibid.* lxxxvii.). On May 6th, 1882, the Forest was formally dedicated to the public by our late revered Sovereign, Queen Victoria, and shortly after this ceremony the Club had again to take action in opposing another and more serious attempt at railway encroachment (*Ibid.* III., xcviii.) The agitation in this case assumed more than local significance, and our action was watched, approved of and supported by large numbers of natural history societies and by individual men of science throughout the country. Deputations convened by the Club were received at the House of Commons on Feb. 20th, 1883, by Sir John Lubbock, and on March 9th, by Sir Selwin-Ibbetson and Lord Eustace Cecil, and three days later, on the motion of Mr. James Bryce, the Bill was thrown out on its second reading by a majority of 148 (*Ibid.* IV., viii.) The story of these polemics is buried in our archives and may be regarded as ancient history. It does not often devolve upon a scientific society to assume the functions of a body militant, but it must be remembered that we looked upon the Forest as a natural-history preserve which it was our duty to guard most jealously from unnecessary molestation. It is to be hoped that this policy will be maintained by

the Club and that our fighting forces will be always found ready to take the field should any similar dangers threaten the Forest in the future.

More in harmony with the work of a Society such as ours is legitimate criticism, discussion and advising in connection with the management of the Forest in so far as forest management is a question of applied science. Very early in the history of the Club we had occasion to take alarm at certain indications of policy with respect to the management, and a discussion was held at a meeting in February, 1882, when the general question of the management of the Forest and the necessary measures for the protection of its animals and plants were considered by many experts, the Verderers being represented on that occasion by Mr. Andrew Johnston (*Proc.* III., *Appendix No.* I.. pp. ix. *et seq.*). A conference with Mr. E. N. Buxton and his brother Verderers was subsequently held in June, 1882, at Knighton (*Ibid.* III., xxviii.) The full report of the discussion and the papers communicated at the meeting in February, together with the opinions of experts and the statement prepared in connection with our opposition to the railway scheme of 1883 were all brought together as a contribution to the general subject of the Forest management in an Appendix (*No.* I.) to the third volume of our *Proceedings*. That Appendix contains an Editorial introduction giving an excellent historical summary of the state of affairs down to that period and papers by Dr. M. C. Cooke, Prof. Boulger, Mr. Harting, Mr. Burrows and myself.

A few years later, in 1889, the management of the Forest formed the subject of a series of virulent attacks in certain newspapers. Without committing the Club collectively to any action in connection with this anonymous and irresponsible agitation, a meeting was held in April of that year in order to inspect the portions which had undergone thinning, and a discussion took place, in the course of which Prof. Boulger made some valuable criticisms and suggestions concerning certain details of the operations of which the results had been inspected. No formal action of the Club was considered necessary on that occasion, and the general policy of gradually removing the old pollards and allowing them to be replaced by young trees was in no way opposed (ESSEX NATURALIST III., 164). In 1894 the thinning operations again drew forth newspaper

criticisms, at first from writers whose opinions were worthy of serious consideration, but who were apparently uninstructed as to the true condition of the Forest, and ultimately from the Press at large, fomented into rancorous activity by irresponsible scribblers and condemning the action of the Verderers with that vehemence and assurance which are so generally found in association with a profound ignorance of the subject under criticism. It appeared that the time had arrived for formal intervention by the Club on behalf of the Verderers, whose case had been so grossly misrepresented in the course of the newspaper controversy, and the great meeting of April 28th, 1894, will always remain memorable in our annals as having been the occasion for the free discussion of the action of the Verderers after having given our members and the public the opportunity of seeing for themselves the places where thinning had been going on, and of hearing from Mr. Buxton on the spot the reasons for carrying out these operations (ESSEX NATURALIST VIII., 52—71). That meeting as you all know resulted in what was practically a vote of confidence in the Conservators, and marked the beginning of the turn of the tide of popular opinion. In this we may, I think, take credit for having done a good piece of work for the benefit of the Forest, for if the ignorant clamour that had been raised had been allowed to take practical form by paralysing the hands of the Conservators, the Forest would have lost the valuable supervision of the best informed and most skilful of its Verderers to its everlasting detriment. The first report of the experts appointed by the Corporation of London to examine into the operations in progress was made on June 4th, 1894 (ESSEX NATURALIST VIII., 117) and in substance shows that the vote of confidence passed at our meeting in April was justified (see *Nature*, July 5th, 1894). The agitation was renewed the following year, and resolutions passed at a public meeting of the complainants held at Wanstead were presented to the Epping Forest Committee of the Corporation of London by a deputation on May 13th, 1895. It was not thought necessary on this occasion to bring further organised resistance from the Club to bear upon the controversy as no new arguments or facts had been adduced by the agitators, but I ventured to collect on my own responsibility a large body of expert evidence and of opinions from representative men, all of whom had personally inspected the Forest, and also from many leading inhabitants of

the Forest district, all expressing approval of the action of the Conservators. The two memorials were presented by me at a meeting of the Epping Forest Committee on May 10th, 1895, the deputation having been introduced by Mr. Andrew Johnston, and having consisted of several representatives of the Club in addition to Mr. Joslin, the High Sheriff of Essex, and Sir Robert Hunter. The outcome of this second agitation was the appointment by the Corporation of a second Commission of inquiry by the same experts, and their report was presented in November, 1895. This second report practically endorses their first, and has convinced the public that no danger need be apprehended from the action of the Conservators. The memorials and the final report of the experts will be found in the ESSEX NATURALIST (IX., 74–80) and in the same volume Mr. Edward North Buxton published his views concerning the principles governing the management of the woodland in the Forest (pp. 233–236). On many occasions since the decisive meeting of 1894 have we given our members opportunities of seeing for themselves the actual results of the judicious attempts of the Conservators to naturalise that tract of most unnaturally pollarded woodland which was committed to their care by the Epping Forest Act of 1878. That their policy was sound and that their efforts have been and are being crowned with all the success that can be reasonably expected is amply justified by the present condition of the Forest. There remains much to be done to insure its perpetuation as a forest for the generations to come, since there are still very serious dangers threatening the growth of the new vegetation from which is to be developed the forest of the future. But this address deals rather with the past than with the future, and any expression of opinion concerning methods that may yet have to be adopted would be out of place on the present occasion.

In one other respect since the dedication of the Forest in 1882 have we reason to rejoice in the association of the Buxtons with that district. In that year some twelve acres of land known as the Oakhill Enclosure on the Theydon Road were threatened by the builder, and attention was called to this danger by our Secretary (*Proc.* III., xi.) In May, 1889 the Lord Mayor of London, at a dinner of the Epping Forest Committee, read a letter from Sir T. Fowell Buxton which practically amounted to an announcement that he and his brother, Mr. E. N. Buxton, has

purchased the plot of land in question and had presented it to be kept as part of the Forest for ever. This generous addition was acknowledged by a resolution passed by the Club at the meeting held at Writtle Park in that same month (ESSEX NATURALIST III., 57). Again, in 1890, Mr. Andrew Johnston announced at a meeting held in Epping Forest on May 17th, that Sir Fowell and Mr. E. N. Buxton and a relative had made an offer of contributing towards a fund of £6,000 which was required for the acquisition of a portion (over 30 acres) of Highams Park at Woodford (*Ibid.* IV., 127). Of the total amount required the sum of £3,000 was provided by the Corporation of London, and of the £3,000 which it was required to raise locally the Buxtons offered £1,800, the remainder having been subsequently raised as set forth in the history of this addition to the Forest printed in full in the ESSEX NATURALIST (V., 137). It was again the pleasant duty of the Club in Dec., 1890, to pass a resolution thanking the Buxtons for their munificent action in connection with this matter (*Ibid.* IV., 230) and a meeting was held in March, 1891, to enable our members to see this latest addition to the Forest (*Ibid.* V., 129). Once again, in October, 1898, Mr. E. N. Buxton presented as a further contribution to the Forest the picturesque elevation known as Yardley Hill, an addition of some 28 acres in extent (*Ibid.* XI., 78; see also p. 268). A meeting held in June, 1899, enabled our members to realize the extent of public indebtedness to Mr. Buxton, to whom a vote of thanks was again accorded on behalf of the Club (*Ibid.* XI., 129).[4]

A few papers concerning the history and topography of the Forest district have been contributed to the Club, such, for example, as Mr. W. C. Waller's notes on the old track from London to Epping (ESSEX NATURALIST VI., 206), on old Loughton Hall (*Ibid.* VII., 14), on the Epping Hunt (*Ibid.* VIII., 31), and on the Barclay-Johnston MSS. and Papers relating to Epping Forest (*Ibid.* IX., 157), and Mr. I. C.

4 With reference to the history of the rescue of the Forest for the public, Mr. E. N. Buxton writes to me under the date of February 27th :—"My services are as nothing to my brother Fowell's. By backing up Willingale against the Lords of Manors long before the City came in, and when the cause was unpopular, he not only did a thing which required the highest moral courage, but without it there would have been no Forest to preserve. Single-handed he arrested the wave of enclosures . . . . . of the little bits I have been able to add the Highams Park was the most difficult transaction and the most interesting." While this Address was passing through the press it was announced at the Court of Common Council that Mr. Gerald Buxton had purchased and presented as another addition to the Forest, the greater part of Bell Common, Epping, and the waste land along the Ivy Chimnies Road.

Gould's note on a Forest Document of the Eighteenth Century (*Ibid.* IX., 72). We have had also special communications on the Forest Lodges by Mr. Waller (*Ibid.* VII., 82) and on Queen Elizabeth's Lodge, the headquarters of our Epping Forest Museum, by Mr. James Cubitt (*Ibid.* IX., 166) and Mr. W. W. Love (*Ibid.* XI., 153). I will venture also to remind you that in 1894-95 I succeeded in re-discovering most of the old boundary stones on the eastern side of that wide expanse of country which constituted the Great Waltham Forest of early times, the area which we now propose to accept as the Forest district in connection with the Chingford Museum. The stones in the Navestock district were visited by the Club on July 28th, 1894 (ESSEX NATURALIST VIII., 213) aud the complete story of the boundary stones published the following year (*Ibid.* IX., 1). The account of the perambulation of 1641 when these stones were set up was reprinted in a paper "On the Area of Epping Forest for Faunistic purposes," published by our Secretary in 1892 (*Ibid.* VI., 10). The work of the Club is recognized also in Mr. E. N. Buxton's excellent little book *Epping Forest*, which contains many references to our publications as well as several contributions from our members.

IX.—MISCELLANEOUS WORK.

Much of the work done by our Club, as in the case of other local societies, does not admit of being exactly pigeon-holed. Field meetings naturally call forth communications concerning the history of the places visited and of their more interesting buildings and antiquities, as well as biographical sketches of any past inhabitants who may have made the place famous. Thus much topographical and biographical information has found its way into the reports of our field meetings, adding very much to their interest, although such information does not strictly speaking come within the province of a scientific society. The biographies of famous Essex people who have made their mark as workers in science must, however, always be regarded as legitimate matter for publication in our pages, and I am glad to be able to refer to many such communications. The purely antiquarian and topographical interests centreing in our County are already well catered for by the Essex Archæological Society and the *Essex Review*, and their is no occasion for any unnecessary duplication of work in this direction.

Biographies. Among the biographical notices of Essex scientific worthies I may refer to Professor Boulger's presidential address in 1885, dealing with the life and work of our most illustrious naturalist, John Ray (*Trans.* IV., 171), supplemented by another paper on the domestic life of John Ray at Black Notley, also by Prof. Boulger (*Proc.* IV., clix.), and by another on John Ray as an entomologist, by Mr. Fitch (*Ibid.* clxv.) A notice of Benjamin Allen, of Braintree, the contemporary of Ray was published by Mr. Fitch in 1890 (ESSEX NATURALIST IV., 192). Prof. Boulger also gave us in 1888 a paper on the life and works of the celebrated Dr. Derham of Upminster (*Ibid.* II., 133), but this does not appear to have been published. A meeting in conjunction with the Gilbert Club at Colchester, in 1890 (*Ibid.* IV., 174), gave an opportunity for the communication to the Club by my colleague, Prof. Silvanus P. Thompson, of a life of Dr. William Gilbert, the author of the great work on *The Magnet* and founder of the science of electricity (*Ibid.* V., 50). Prof. Thompson, I may add, had previously in 1887 lectured to the Club on Gilbert's magnetic work (*Ibid.* I., 94). Christopher Saxton, the draughtsman of the oldest known map of Essex, formed the subject of a notice by Mr. Avery, in 1898 (*Ibid.* XI., 240). Izaak Walton's association with the River Lea formed the subject of a paper read by Mr. Harting in 1894 (*Ibid.* VIII., 186). Among Essex scientific worthies of later times I may refer to Christopher Parsons, noticed by Mr. Fitch (*Ibid.* III., 55), and John Brown, of Stanway, whose life was published by Mr. A. P. Wire in 1890 (*Ibid.* IV., 158) and supplemented in 1898 by a note by Messrs. Kennard and Woodward on a manuscript note-book left by that famous old naturalist and now in the library of the British Museum of Natural History (*Ibid.* X., 288).

A visit of the Club to Constable's country, the vale of Dedham, in 1893, enabled us to receive from Mr. Charles Benham a paper on "John Constable as a Naturalist" (*Ibid.* VII.; 112).

Topography. The conductors of our field meetings have in many cases been at great pains to draw up interesting accounts of the places visited, and we have thus published some few papers and many notes which may be classed as topographical contributions. A meeting at Chigwell in July, 1881, produced a most interesting history of that place from the pen of Mr. T.

Fisher Unwin (*Proc.* II., xxxiv.) In like manner we have received and published "An Angler's Notes on Dagenham Lake," by Mr. John Hillier (ESSEX NATURALIST VI., 146), and a paper on Dagenham Breach by Mr. Walter Crouch (*Ibid.*, 155). The voyages down the River Lea on the Conservancy barge under the conductorship of the late Major Lamorock Flower, have also led to the publication of much information about that river. Thus, in July, 1894, Major Flower gave an address (*Ibid.* VIII., 206); subsequent meetings on the Lea in June, 1895, and June, 1896, gave rise, among other contributions, to Mr. Crouch's "Notes on the River Lea; Bromley, Bow, Old Ford" (*Ibid.* IX., 89; see also report of second voyage from Hertford to Waltham Abbey, *Ibid.*, 208) and to Mr. W. C. Waller's "Episode in the History of the River Lea" (*Ibid.*, 190). An excursion from Maldon to Chelmsford in 1891 gave us Mr. Fitch's "Notes on the History of the Chelmer and Blackwater Navigation" (*Ibid.* V., 248); a meeting at St. Osyth and Brightlingsea the same year gave us Messrs. Shenstone and Laver's "Notes on the Colne Oyster Fishery" (*Ibid.*, 257). A famous visit to Maldon and the Blackwater Estuary, under the conductorship of Mr. Fitch in September, 1888, resulted in a report replete with the topography, archæology, geology and natural history of that district (*Ibid.* II., 229-250) to say nothing of an illustrated versified account of the excursion by Mr. F. Carruthers Gould, whose *New Song of Maldon* cannot, however, be claimed as one of the Club's publications. As contributions to antiquarian topography we may consider Mr. I. C. Gould's paper on "A Naturalist in Essex a Century and a half ago" (*Ibid.* VI., 112) and Mr. Crouch's "Astronomy in Wanstead" (*Ibid.* VII., 151), while the Rev. S. Coode Hore's paper on "Navestock in Olden Days; stray notes, Pre-historic, Saxon and Norman" is a masterpiece of local history (*Ibid.* VIII., 220).

Sanitation. In a few directions our work has come into contact with sanitary science. In 1890 Mr. William Rome sounded a note of alarm concerning the proposed discharge of the London sewage into the sea at Fowlness and Southminster and the effect upon the Essex oyster culture (ESSEX NATURALIST IV., 41), a proposal which was fortunately afterwards withdrawn (*Ibid.*, 125). Dr. J. C. Thresh gave us a paper on "The Sanitary Condition of Essex," in 1890 (*Ibid.* 97), and another in 1891 on "Vital Statistics for the County of Essex" (*Ibid.* V., 47), and in

his presidential address for 1896 Mr. David Howard gave us a chapter on the water supply of the River Lea viewed in the light of recent researches (*Ibid.* IX., 150).

CONCLUSION.

The record of work now summarised is the sequel to the "Inaugural Address" of 1880. We may claim to have carried out our programme, and, considering the slender means at our disposal, I venture to think that our achievements are such as to reflect credit upon our contributors and upon the Society as a working body. The *Victoria History* of the County when completed will bear testimony to the value of our labours; the annual catalogue of papers published by the Corresponding Societies Committee of the British Association bears witness to our having taken a leading position among the local societies of this country. Not only is the Club indebted to those members who by their work have enabled us to realise the objects which we had in view at the outset, but our obligations to those of the executive officials who have undertaken the arduous labours of administration during the past twenty-one years are too great to be allowed to pass unnoticed on the present occasion. Many have taken part at various times in this administrative work, but it will not, I am sure, be considered invidious if I refer to the fact—well known to you all—that the whole labour of editing the publications referred to in this Address has been carried out by Mr. William Cole, who has also acted as Hon. Secretary during the entire period of our existence. In addition to these duties, Mr. Cole has been Curator of both our museums, and his brother, Mr. B. G. Cole, has also given his services as Assistant Hon. Secretary, while the artistic skill of Mr. Henry A. Cole has been freely placed at the disposal of the Club for the illustration of the pages of our publications. Without this valuable assistance it would have been impossible for us to have given our members so many illustrations as we have been enabled to through Mr. Henry Cole's gratuitous contributions.

The record of twenty-one years as herein set forth should encourage us to look forward with every confidence to a period of equal or even greater activity in the future. It might, perhaps be urged that we should have done more. Possibly this may be the case, but I do not think that we have

reason to be dissatisfied on the whole with our output. It must be remembered that the chief source of expenditure in a society such as this is publication. By this is our utility made manifest to our members and to the public at large. But publication is limited by income, and the latter is dependent upon our membership. We have, like most other societies, seen periods of elevation and depression—we have passed through our crises and we may now flatter ourselves that the Club has found a home where its labours can be carried on peacefully and uninterruptedly. In view of our past achievements we are at any rate justified now in pleading for further support. A list of Members of under 300 means an income of about £150 to £200 per annum, out of which we have to meet the cost of publication and to furnish our contribution to the curatorial expenses of the museum. If our members would like to have a larger volume of the ESSEX NATURALIST every year—and this is a consummation devoutly to be wished—we must increase the numbers of our subscribing members. Our subscription is not ruinous; I know of no society of a like nature from which its members get so much in return for their subscription in the way of meetings and publications. I certainly think that our journal might be issued more frequently and more regularly, and now that the chief burden of organizing the museums is off our Editor's shoulders we may look for improvement in this respect. But the total amount of printed matter—apart from the frequency of issue—cannot very well exceed our present volumes with the income at present available. It is an encouraging indication that we have discharged our functions towards the scientific world that the supply of original contributions has practically never failed during the twenty-one years of our existence. That seems to me one of the very healthiest signs of our vitality, and I confess that it is an experience which, in view of the history of many local societies, has caused me no little surprise. Our position has generally been that we have had more material in hand than we have been able to afford to publish. That is the state of affairs at the present time. Much as we have accomplished during the twenty-one years passed under review there yet remain vast fields for future workers. To encourage this work by joining our ranks, if only out of public spirit for the credit of the County, is assuredly the duty of all who have the intellectual and scientific welfare of that County at heart.

NEOLITHIC IMPLEMENTS FROM THE NORTH DOWNS NEAR SUTTON, SURREY.

By J. P. JOHNSON.

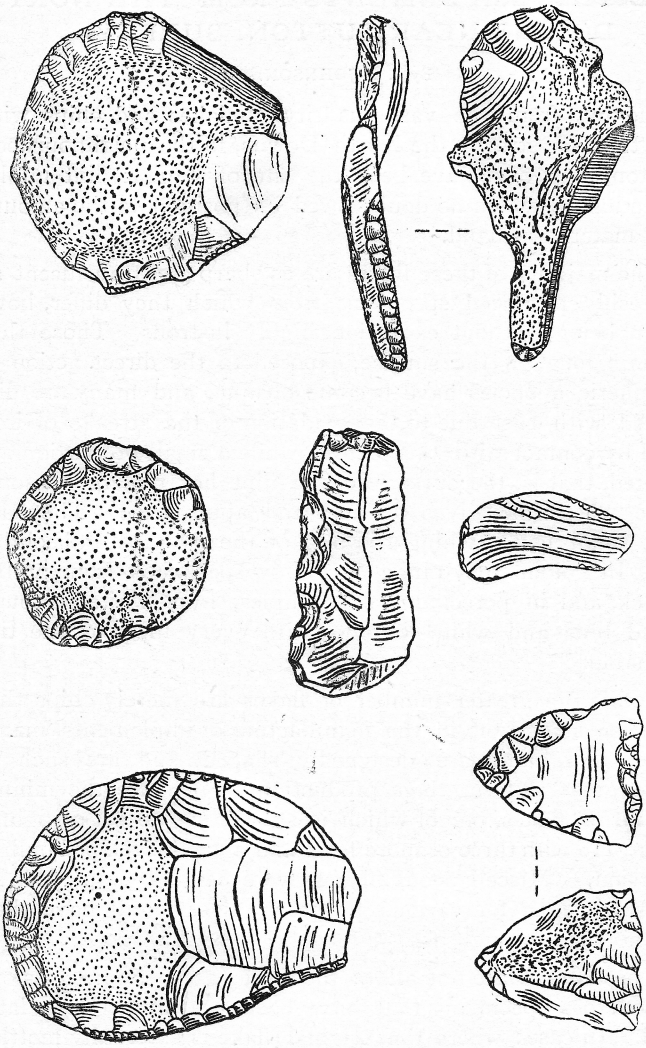
Judging from the vast quantity of flakes and chips with which they are strewn, the North Downs, in the neighbourhood of Sutton, must once have been the site of a great flint implement industry, which no doubt owed its position to the amount of raw material at hand.

The majority of these flakes are as sharp and translucent as any freshly produced specimens, from which they differ, however, in being, without exception, highly lustrous. Those that have lain long on the surface, exposed to the direct action of atmospheric agencies have become opaque, and many are discoloured with rust due to the oxidation of the streaks of iron gained by contact with the plough, while a small proportion are patinated, that is, the surface of the flint has undergone some change which has given it a glazed appearance. They are mostly small, few reaching the size of the average Palæolithic flake. In colour they range, in glassy specimens, from amber to black, and in porcellaneous examples, from white, through mottled blue and white to blue, with every intermediate tint imaginable.

While the greater number of flakes are merely chips that have been struck off in the manufacture of implements, many, on the other hand, are designedly shaped, and are such as require great skill in their production. Such are the minute thin narrow flakes, one of which is shewn in the set of figures on page 118 with three or more faces and a well-developed bulb of percussion. Miscellaneous flakes were largely employed by pre-historic man for various purposes. Nearly all have their edges notched through use.

These flakes are not all of the same age. Sometimes one comes across specimens that have been re-trimmed at a later period. In cases where the original flake is externally mottled and opaque, the newer chipping is black, having penetrated the semi-transparent interior.

The cores from which the flakes have been struck are frequently met with. I have one very beautiful example, con-



Neolithic Scrapers, Fabricator, Arrow-head, Borer and Small Flake ; all of flint.
From the North Downs, Sutton. (Actual size).

sisting of the half of a small nodule of jet-black flint, from which numerous long narrow flakes have been driven. Calcined flints are extremely abundant.

Together with the chips of flint one occasionally finds well-fashioned implements. I have made outline drawings, which are reproduced in the annexed plate, of my choicest specimens.

The three implements at the top are very neatly finished scrapers. Similar implements, mounted in handles, are used by the Eskimos for scraping skins, hence the name. They are the only three of the kind that I have found. Rough, concave and irregularly shaped scrapers are common.

The central figure is either another form of scraper, or else it is a fabricator, *i.e.*, an instrument employed in producing the very fine flaking on arrow-heads, etc.

The drawing in the lower left-hand corner represents the two sides of a chipped arrow-head—the only one I have obtained. I have also a very beautiful flake arrow-head. Small triangular flakes that were probably used as arrow-heads are abundant.

The adjacent figure shews one of the pigmy flakes referred to above.

The instrument of which two views are given in the lower right-hand corner, is a remarkably fine borer. It does not appear to be quite finished, one edge of the boring portion being only partly chipped.

The above-described implements are all in the same fresh condition and seem to be of the same minor age. With the exception of the arrow-head, they are all fashioned out of flakes, the reverse side consisting in each case of a smooth surface, with a prominent bulb of percussion at the untrimmed end.

I think one is justified in assuming that these highly finished implements were made for the purposes of barter to other people who were neither so skilled in their manufacture, nor so favoured with a supply of siliceous material. Considering the amount of flint *débris* scattered over the Downs, an enormous number of implements must have been produced. If they had been used by the makers only, one would expect to find them on the site of manufacture, where, however, they are really rare.

NOTES ON THE BLACK-HEADED GULL IN ESSEX IN 1901.

By PERCY CLARK, B.A.

To the casual visitor up the muddy Essex estuaries, perhaps little annual change in their state and condition is apparent, and yet constant forces are at work in those regions, which sometimes more or sometimes less must make their inevitable mark.

A tidal wave comes up from the North Sea, such as in November, 1897, and swamps an island or a marsh, leaving deposit behind which tells a tale for years after; perhaps a portion of the coast is abandoned to the ever-encroaching wave, which has happened here and there, and the waters of the sea in places permanently enlarged their sphere.

But even in its ordinary and normal rotation the regular ebb and flow of the tide, carrying its volume of mud in solution, as it overswells the tangled foreshore will by imperceptible degrees gradually raise its level, so that the flats even recently reclaimed and enclosed by sea walls, are already distinctly sunk below the higher portions of the saltings that remain outside them.

This will be noticed all along the Essex coasts, and as the sea is still gaining on those shores, and when unhindered by artificial means, working a relentless devastation and ruin; it proves that on the whole the land has a tendency to sink, notwithstanding the amount of deposit that is left after every flood.

The working of this law is perhaps seen clearest in the Broad district of Norfolk and Suffolk, where the path of the tidal rivers has become in this way so raised above the surrounding marshes that sailing along them, is like travelling on an elevated canal.

But be this as it may, the Black-Headed Gulls for the last few years seem more and more inclined to build their nests and breed on the stretch of saltings that border our tidal channels. Possibly they may have found that in some places the relative height of the saltings is increasing, and that for the present, only abnormal spring tides submerge the higher parts.

This habit of the birds is nothing really new, for a century ago (roughly speaking) many of the salting islands in the Essex Rivers were even then famous as their breeding haunts.

But whether owing to a subsequent and more rapid submergence of the land, or owing to the persecutions of egg collectors and others, this custom was abandoned by the gulls, it is certain that just now they are reverting to their former instincts.

Such is the case, for instance, in Hamford Water, where, as I have previously noted,[1] of late years a large and flourishing colony of Black-Headed Gulls seems to have permanently established itself.

In the summer of 1901 I found that the gulls had settled their nursery on much the same stretch of saltings as they had done the year before, but this time to the west of the creek leading to the hard on Horsey Island, instead of to the East of it, and paying a visit there on June 6th last I soon discovered about 30 nests, most of them containing three eggs.

The little islets in the muddy creeks were especially patronised, and were beyond my reach, but the nests I came across elsewhere were all, as usual, among the thick weeds and grass at the highest point of the saltings, and were of the low and scanty construction which I have previously described. I calculated that there were about 100 birds flying around, much the same numbers as in 1900.

At the hard on the island close by I met a farmer's boy who asked me if there were any birds breeding on the saltings, and informed me he had never yet seen a gull's egg; a remark which I considered very satisfactory, though I rejoined that if ever he did happen to do so, it was penal to remove it.

From Hamford Waters I sailed the next day, June 7th, to the Colne, and on the St. Osyth Marshes by "Bricclesea" I found the Black-headed Gulls as busy and numerous as ever.

Here also there were about 100 birds wheeling overhead and I soon discovered without any difficulty about 30 to 40 nests; indeed the birds make no attempt at concealment, as the saltings here are very open, entirely lacking even the slight protection afforded by the denser growth of grass and herbage which characterises Gullery No. 1.

Though early in the summer (I was a month sooner than usual in my visit), there were several young birds just hatched in

[1] ESSEX NATURALIST, Vol. xi., p. 312, Mr. Clark's previous papers on the Essex Black-Headed Gulls will be found in Vol. x., p. 388 and Vol. xi., p. 184.—ED.

the nests, and others were cracking the shells and hatching, and there were many eggs in pairs and single ones.

I had landed from a boat at the far side of the creek, but was not to pass unnoticed, for before long I was espied by Mr. Cross of the adjoining farm, who came riding down across the flats to see what I was doing, proving that any pillagers with bad intent would with difficulty escape his keen watchful eye. We two, however, had met before, and he readily forgave me my intrusion on his property.

On May 20th, he informed me, he had counted 60 nests of Black-Headed Gulls upon the saltings, and he thought the birds had certainly increased during the last year or two, although the spring tides still wash and carry away many of the eggs.

The gulls, he said, had now almost deserted the fresh water fleets farther inland, amid the thick flags and weeds of which they were formerly wont to make their nests, and nearly all of them had migrated to the neighbouring saltings.

I was much pleased with the account he gave, and left Gullery No. 2 feeling well satisfied with the condition of affairs ; sailing the next day to West Mersea where I hoped to encounter on Tollesbury Marshes a similar pleasant experience.

But I am sorry to say there were no gulls there this year (1901). In 1898 there were only a very few, in 1899 there was a good-sized colony, on one of the large fresh water fleets, but the spring of 1901 was a remarkably dry one, and already early in June the water was extremely low in the ponds and ditches. This might account for the desertion of the birds, but my own impression is, as I have said before, that the gulls are reverting to an old habit, and prefer nesting on the saltings, and doubtless the colony from Tollesbury had followed suit. There was not a Black-Headed Gull to be seen on those dreary level flats, and I spent the best part of an afternoon in a fruitless search; so Gullery No. 3 must be erased this year out of my list, and very probably will not appear again.

The result then of these investigations for 1901 consists in my being able to report, that two strong Gulleries, instead of three, are still flourishing in the county, with every promise that they will thrive and further increase in the future; my only regret being that Gullery No. 1 in Hamford Water can boast of

no kindly guardian like Mr. Cross, who presides with such efficient care over the destinies of the one near Brightlingsea.

POSTSCRIPT—

Since writing the above, I have been in correspondence with Mr. Charles Dawkins, who has kindly given me information of a large colony of Black-Headed Gulls on the Wick Marshes near Tollesbury.

These are not far from the Hall Marshes which I drew blank this summer, but Mr. Dawkins informs me, he has known the Wick Gulleries for 13 years, and though the birds and nests have annually fluctuated considerably in numbers, they have at no time been completely absent.

It appears that in this locality the gulls still build their large clumsy nests among the reeds of the bigger fleets, and Mr. Hawkins writes that he might have put the numbers of them this year considerably above the figure he quotes in the last number of the ESSEX NATURALIST (*ante* p. 69). He says the marshmen take very good care of the nests, and his account generally is most satisfactory, so I must now add another prosperous gull colony in Essex to my list.

Perhaps bye-and-bye we may even hear of more among the islands at the mouth of the Crouch.

ORCHIS MACULATA, SUB-SPECIES ERICETORUM, LINTON, IN EPPING FOREST.

By C. E. BRITTON.

Three or four years ago my friend, Mr. James Holloway, expressed to me his opinion, that the Spotted Orchis of Epping Forest was somewhat different from the usual form of *Orchis maculata* found growing elsewhere. Last year (1900) the Epping Forest form of *Orchis maculata* was again mentioned by Mr. Holloway, and it then occurred to me, that, in all probability, this plant was the recently described sub-species, *Orchis ericetorum*, Linton. During the present season, we have both paid a certain amount of attention to the Spotted Orchis in Epping Forest, with the result that the occurrence of *O. ericetorum* as a Forest plant is firmly established. Indeed, we have seen no Spotted Orchises that seem referable to *O. maculata* in a restricted sense. A number of our plants were sent to the Rev. E. F. Linton for

verification, who wrote in reply, "All the specimens you sent two days ago were my *Orchis ericetorum*." The plants forwarded were gathered at High Beach and over St. Thomas's Quarters. Perhaps it may be useful to give the original description of *O. ericetorum*, Linton, from *The Flora of Bournemouth* (1900), pp. 208-9:—

"More slender than the type; stem usually somewhat purplish above; leaves narrower, more or less recurved, even the lower cauline more or less acuminate, carinate and folded; spike 1 to 2 inches, broadly pyramidal, at length oblong; bracts purplish; flowers pale, scentless, with rose-purple markings, ground commonly white or tinged with pink, but sometimes of deeper colour; outer line of markings nearly or quite complete; nectary slender, slightly enlarged or not at all upwards, throat narrow; lower lip sub-orbicular, rounded in outline, rather spreading; mid-lobe much smaller than the broad obliquely truncate or crenate lateral lobes, not exceeding them in length and usually shorter or somewhat recurved.

"Compared with this sub-species, or rather species, if a sufficient number of these distinctions are found on further examination to hold good, the type is rather a stouter and commonly bigger plant, with broader, straighter leaves, less carinate and folded, frequently flat; spike 1½ to 2½ inches, ovate-oblong in flowering, oblong at length bracts more usually (? always), green; flowers with dark rose-purple markings (the outer line *pl. m.* disjointed) on a pale rose-purple ground; faintly aromatic (? always); nectary stouter, enlarged upwards, throat gaping obviously, lip deeply 3-cleft, vertically pendent; lobes sub-equal, lateral obliquely oblong crenulate; mid-lobe deltoid-oblong or deltoid-acuminate, distinctly exceeding and not much if at all narrower than the lateral, usually straight.

"These two plants have a wide distribution in Britain: sub-species *ericetorum* has been noted from Caithness and Sutherland to the South Coast and Guernsey, and also from Co. Wicklow. A supposed hybrid between the two occurred in Glen Lockay, Perthshire, but they seldom are found in the same locality."

"Moist places and bogs on heaths" are the habitats given. There can be no doubt that of the characters ascribed to *O. ericetorum*, some are of questionable value. Thus, some of the Epping Forest plants possess a pleasant odour; the bracts and stems are more frequently green than purplish, and though some plants show the lip with the outer line of purple markings complete, these are in the minority. The characters which to me seem most helpful in determining *O. ericetorum*, are the narrow leaves, small spike of pale flowers, mid-lobe of lip smaller than the lateral, general slender habit and its heathland habitat. Typical *O. maculata*, whilst it may be present in the Forest, I have not encountered, and, on the open heathy parts, *O. ericetorum* seems to be the only form present.

SEA-SIDE PLANTS.

BEING THE SUBSTANCE OF AN ADDRESS DELIVERED AT CANVEY ISLAND, JUNE 15th, 1901.

By PROF. G. S BOULGER, F.L.S., F.G.S., V.P.E.F.C.

Although not myself a total abstainer, I can feel for the inhabitants of this island, animal and vegetable alike, who may be said, in the words of the poet, to be surrounded by

"water, water everywhere,
Nor any drop to drink."

As we have walked along the sea-wall and beach we have noticed a variety of flowering plants, members of several widely differing Natural Orders, which agree in the common property of succulence, succulence both in stem and leaf, accompanied for the most part by a smooth surface, and in some cases by a blue-green waxy "bloom." The Marsh Samphire or Glass-wort (*Salicornia herbacea*), the Sea-blite (*Suæda maritima*), and the Crab-weed (*Atriplex portulacoides*), which grow on the "saltings," where they are overflowed at high tide, are, it is true, members of one Order, the *Chenopodiaceæ*; but the Yellow Horned Poppy (*Glaucium flavum*), the Stone-crop (*Sedum acre*), which we found so luxuriant, the Sea Sandwort (*Alsine marina*) and the variety of the Carrot (*Daucus carota*, var. *gummifer*), which occur a little farther inland, belong to very diverse groups; yet all agree in these outward characteristics, as do many other sea-side plants, such as the Sea-Kale (*Crambe maritima*), which we have not come across to-day. If we examine the structure of these plants microscopically we shall find that this succulence is largely produced by a thick, almost leathery outer wall to the epidermal cells and the presence of a large amount of water (salt-water) in the internal cellular tissue, while it is accompanied by a very small number of stomata or transpiration-pores. This thick impermeable cuticle and this internal store of water are precisely similar to the structures that we find in desert plants. We have, in fact, in these plants growing close to the water's edge special adaptations to check transpiration, to economise water. Why is this? A familiar laboratory experiment throws light upon the question. If we place a thin section of fresh beetroot—a plant of sea-side origin, by the way—under the microscope and bathe it with a 5 per cent. solution of salt, we find that the red proto-

plasmic contents of the unbroken cells contract and withdraw from the cell-walls, the space between the walls and the contracted cell-contents being occupied by the solution of salt. In fact the living protoplasm is unable to absorb the salt and has actually to give up some of the water with which it is saturated to the hygroscopic salt-solution around it. If, on the other hand, we kill the protoplasm, by boiling or by the application of acid, before applying the salt solution we find that the latter diffuses readily into the dead cell-contents and there is no such contraction as in the first case.

This indicates that plants whose roots are supplied with salt-water are able to assimilate for purpose of nutrition but a very little of the water which reaches them : they are to a great extent subjected to a water famine ; and they have developed— in many different Natural Orders — water-saving structures. Chemical analysis shows us that the plants have no choice in this matter. As the sea water is rich in salts of soda, so the ash of these sea-side plants is rich in soda ; but it can readily be demonstrated that most, if not all, of this soda is physiologically useless to the plant, which cannot, however, refuse to absorb it. Not only do experiments in growing plants in prepared solutions demonstrate that they can maintain their full health and vitality while dispensing with soda ; but when a sea-side plant, such as *Asparagus*, which occurs on another part of our Essex coast, is transferred into ordinary inland garden mould, which is rich in potash but poor in soda, the soda in the plant-ash rapidly becomes replaced by potash. It is, however, important to bear in mind that the converse of this experiment, the replacement of potash by soda, cannot be performed, some potash being apparently essential to the life of every flowering plant.

Succulence is not, however, the only adaptation to the economising water of which we have seen examples to-day. In several species of grass, such as the Marram (*Psamma arenaria*) and the Lyme Grass (*Elymus arenarius*), which grow near the sea, we find the leaves are rolled up and their surface, not only "glaucous," or covered with grey bloom, but marked by deep longitudinal grooves. To these grooves the few stomata are confined, and, in some cases, hairs lining the grooves would seem to be a special contrivance to re-absorb the moisture directly it has been transpired by the protected stomata.

We have then in this assemblage of sea-side plants, or "halophytes," as the physiologist terms then, of widely differing kinship, a response to the nature of their environment, producing structural modification in more than one direction, though for the same physiological purpose.

[At the delivery of the above address in response to remarks by Prof. Meldola, Mr. Boulger added that :—

He quite recognised the important bearing that the subject to which he had directed attention had upon the much debated questions of the direct action of the environment and the inheritance of acquired characters. He was afraid that botanists could not feel themselves in a position to decide these questions at present. Experiment—long continued experiment—was necessary ; but, though, perhaps, all the facts to which he had alluded that day might be explicable by special adaptation of each individual and the elimination of the unadapted by natural selection, he thought it possible, if not probable, that, after many generations of such influence, adaptational characters might become fixed, so as to be inherited without liability to loss by reversion.

EPPING FOREST FUNGI: REPORTS ON THE SPECIES OBSERVED AT THE FUNGUS FORAY ON OCTOBER, 12th, 1901.

[As on previous occasions, Dr. Cooke and Mr. Massee kindly undertook to determine the more interesting species gathered, and their reports follow. Attention should also be called to Mr. Massee's note on the new *Amanita* in the present part of the ESSEX NATURALIST.]

NOTES ON THE LARGER FUNGI OBSERVED.

By M. C. COOKE, M.A., LL.D., A.L.S., &c.

I found an *Agaric* at High Beach eleven years ago (1880) and could not satisfy myself at the time of its name and situation. Looking over my drawings, which have not been published, I find this species, and now I am able to place it as follows :—

Collybia pulla, Schœff t., 250. Bolton t., 15.

Pileus fleshy, thin, campanulate then expanded, obtuse, even, smooth, hygrophanous ; stem usually hollow, twisted,

rather striate, soft, naked, gills adnexed, rather broad, transversely pellucid striate, whitish. *Sacc. Syll.*, No. 767.

On Beech trunks, stem abruptly rooting, cuticle soft and polished. Pileus purplish bay, almost black, dusky when dry, about an inch across, before expansion, stem two or three inches long.

Amongst the specimens found and exhibited on the 12th Oct., were :—

Amanitopsis fulva, Schœff, which resembles the ordinary *Amanitopsis vaginata*, but, instead of being grey, the pileus is bright brown, and instead of being edible, the fungus is suspected of being deleterious.

Pleurotus pantoleucus, Fr. Cooke, *Illustrations* t. 275a, described in Cooke's *Handbook*, 2nd Ed., No. 368. Growing on trunks.

Russula azurea, Bres. Cooke *Illus.* t. 1088, on the ground.

Boletus aurantiporus, Howse. A fine species with large bright yellow pores.

Calocera stricta, Fries. On dead wood and branches. First time, Epping.

Entoloma porphyrophœa, Fr., on the ground, possibly recorded before under the name of *Entoloma jubata*, Fr.

Mr. W. G. Smith has also reported **Lactarius obliquus** for the Forest District.[1]

Amongst rare species, which have been recorded in previous years, were *Russula cutefracta*, Cooke, and *Russula armeniaca*, Cooke, found again in 1901.

Add also for the first time at Epping **Tricholoma circumtecta**, Cooke. *Illus.* t., 1182.

I fancy this to be the best record of new and rare Forest Fungi for at the least ten years.

LIST OF THE MICRO-FUNGI OBSERVED.

By GEORGE MASSEE, F.L.S.

The following minute species of Fungi were found, principally on dung. Those marked with an asterisk are new to the Forest Flora. Concerning those unmarked, I am uncertain as to their having been recorded before or not.

1 See page 134 of present part.

BASIDIOMYCETES.

*Grandinia crustosa, Fr. On old rotting cast-off clothing.

ASCOMYCETES.

Ascobolus immersus, Pers.
*A. brunneus, Cke.
A. furfuraceus, Pers.
A. glaber, Pers.
*Saccobolus kerverni, Boud.
*S. neglectus, Boud.
*S. depauperatus, Phil.
*Ascophanus microsporus, Phil.
*Ryparobius pelletieri, Sacc.
*R. parvisporus, Phil.
*R. sexdecemsporus, Sacc.
*R. argenteus, B. and Br.
*Bisporella monilifera, Fckl. Both ascigorus and conidial condition. On cut surface of the stump of a tree.

HYPHOMYCETES.

*Stachybotris atra, Corda. On damp paper.

AMANITA CITRINA, GON. AND RAB., A FUNGUS NEW TO BRITAIN, IN EPPING FOREST.

By GEORGE MASSEE, F.L.S. (*Royal Herbarium, Kew*).

This rare species was established and beautifully figured by Gonnermann and Rabenhorst in the *Mycologia Europæa*, p. 2, tab. 4 (1869), from German specimens. From that time up to the present, the fungus has not been observed either in Germany or elsewhere.

A. citrina is the same size, and has the same general habit as the "Fly Agaric"—*Amanita muscaria*, L.—but the pileus instead of being crimson is a clear deep lemon-yellow, with white patches. The species is very poisonous.

I had occasion to visit the Forest during the week following the last "Fungus Foray" (October 12th, 1901), for the purpose of securing some specimens found immature during the Foray, and was fortunate enough to discover two specimens of *Amanita*

citrina on the bank of the little stream behind the "Robin Hood" Inn. I have made a drawing of this very interesting species, which I understand will be placed along with the illustrations of other Forest fungi in the Epping Forest Museum.

A FUNGOID CUCUMBER DISEASE IN ESSEX.

By M. C. COOKE, M.A., LL.D., A.L.S., &c.

It is now five years since I received from Totteridge leaves of Melon which were affected with a new form of Fungus disease, and this was described in the *Gardeners' Chronicle* for the 5th September, 1896, under the name of *Cercospora melonis*.

During the past month (September, 1901) I have had leaves of Cucumber sent to me from Chelmsford, affected with the same disease, and although my query to the sender has never been answered, I presume that the locality is Essex, if it is not really Chelmsford, and therefore comes within the limits of the Essex Field Club.

The leaves are spotted with distinct circular bleached spots, of a pale ochre colour, and about half an inch in diameter. Such spots are brittle and soon break out and fall away, the tissues being quite dead. The dead tissue is traversed by a plentiful mycelium, from which arise darkish olive threads or hyphœ, which are unbranched and septate, about 150 mm. long. These hyphæ bear long conidia, which are almost cylindrical, slightly attenuated upwards, obtuse at the extremities, a little curved, and at first multi-nucleate, ultimately five to seven-septate, faintly coloured, from 80 to 120 mm. long and about 7 mm. thick.

This fungus belongs to the Black Moulds, and most of the species are parasitic upon, and destructive to living plants. As the disease is truly endophytic and is established within the tissues before the spots appear, there are grave doubts whether there is any hope of cure. All that can be done is to prevent its spreading by destroying the infected plants.

NOTES ON FUNGI, FORESTAL AND OTHERS.

MAINLY CORRIGENDA TO THE *ILLUSTRATIONS OF BRITISH FUNGI*.[1]

By M. C. COOKE, M.A., LL.D., A.L.S., &c.

[*Read at the "Fungus Foray," October 12th, 1901.*]

I take advantage of this opportunity to address a few words to my mycological friends, not only those who may hear my voice, but those absent ones who will rest content to hear the echoes through the press. Now that, for the past fifteen years, the fungus forays of the celebrated Woolhope Club have practically ceased, opportunities are few for intercommunication with those most interested in the study of Fungi. Notwithstanding all the laudable efforts to infuse life and vigour into the British Mycological Society, I am much afraid that the labour is greatly in vain, and that gradually, since the cessation of the Woolhope Forays, and the decease of the great moving spirit, there has been a gradual, but certain, decadence in interest, in the subject, and the number of students, has been slowly becoming less and less. To me it has been the source of great regret, not only that so many have been removed to a higher sphere, but that of those which were left, so many have become lukewarm and indifferent, and so few young students have come forward to fill the vacant places. I am forced to the conclusion that the study and interest in the larger fungi has subsided into much the same condition in which it was nearly half a century ago. This I attribute largely to the falling away of the old school of mycologists, by death or otherwise, supplemented by the collapse of the Hereford Forays. It proves, if proof were needed, how much the prosperity of our local societies depend upon the enthusiasm and self sacrifice of one or two active and energetic men.

By your permission I will devote a few minutes to what may at first appear to be a personal subject, although I shall endeavour to avoid treating it in a personal manner. You are all aware that I had the good fortune to print and publish a book of figures of fungi, containing portraits, or what were meant to be portraits, of upwards of a thousand species of Gill-bearing Fungi. With whatever success or failure, this was associated, I

1 These notes, although somewhat foreign to our plan, are printed in our Journal inasmuch as they will be useful to students consulting Dr. Cooke's great work, and they also contain several corrections and additions to our Epping Forest "Fungus Flora."—Ed.

flatter myself that I still hold the record. I often look back with something of surprise as well as gratification, that I was able to accomplish so much. However, it was done with great difficulty, from which I should shrink in these latter days. Nevertheless all human work is to a certain extent imperfect, and I have never laid claim to absolute perfection in anything that I have ever done, least of all in a work of so much difficulty as that which I have alluded to. Now and then I am kindly reminded by some one or other of my friends of a few of my failures, and I suppose that they are rather surprised that I do not accept their strictures with a more grateful heart. Moreover I can say with confidence that I am better pleased at the vindication of truth than the gratification of my own vanity. I think that my days of vanity are all spent, and I am ready to confess my errors, as soon as I become convinced that they are errors. Already I have admitted some in the past, and still one of the most persistent of my critics has lately called on me to make further confession, which I will proceed to do—as far as I can consistent with what I believe to be the truth.

Of the species of *Amanitæ* I have nothing to say, except that I think *A. strobiliformis* was present when the original of Pl. 8 was drawn, and that the execution was faulty and the colour more so, hence the result was a caricature.

As to *Armillaria* the plate called *A. focalis, minor* (pl. 245) can scarcely be any form of *focalis*, but rather of *A. causetta*, from the scaly stem.

In *Lepiota* I think pl. 1180 fairly represents *L. hispida* but pl. 27 does not, and may be referred to *L. clypeolaria*.

Concerning *Tricholoma* I have but few confessions to make, and of these *Ag. portentosus* Fr. comes first, of which Fig. 54 is not a type, indeed I am disposed to let it go as *Collybia platyphylla*, and not very good at that. It was not a drawing of my own, and I never saw the specimens.

I think that *T. argyraceus*, and its varieties, is entitled to rank as a species, distinct from *T. terreus*.

The gills in pl. 49, *Ag. murinaceus* should certainly be grey, which is omitted in the plate.

Pl. 167. *Agaricus virgatus* is a failure inasmuch as the striæ of the pileus should have been of the faintest kind. This plate was spoiled in the printing, and could not be remedied.

As to *Agaricus sadleri*, pl. 127, I have little to say, except that it had the sanction of the Rev. M. J. Berkeley, and at the time I protested strongly that it was only a peculiar condition of *Hypholoma fasciculare*, which view is now accepted.

I fancy that pl. 110 cannot properly be referred to *Clitocybe senilis*, although the Rev. M. J. Berkeley considered it to be so. Certainly it is far from the type.

Collybia pulla, Schft., was found at High Beach, Epping Forest in 1880, but has never yet been recorded as British. I made drawings of it, at the time, which may be published some day.[1]

The little Agarics attached to a yellow sclerotium, published as *Collybia cirrhata*, are doubtless also *Collybia tuberosa*, as no sclerotium is attached to *C. cirrhata*, therefore the whole of plate 144 is *tuberosa*.

A curious *Agaric* was figured at the bottom of pl. 422 under the name of *Agaricus* (*Pluteus*) *phlebophorus*, variety *reticulatus*, which is not a *Pluteus* at all, but a species of *Entoloma*, which has been named *Entoloma cookei* by a Frenchman and doubtless he is nearer the truth.

The fungus figured on plate 317 and called *Entoloma jubata* is not that species, although it somewhat resembles it, but should be called *Entoloma porphyrophœa*.

I don't know what to say about *Ag.* (*Entoloma*) *bloxami* figured on plate 327, but I strongly suspect that it does not differ from *Agaricus madidus*, Fries.

When I first found the species which is figured on pl. 354, I sent a drawing and fresh specimens to Fries, asking him if it was not a slender form of *Ag. terrigenus* but in reply, he informed me that it was not his species, but a new one which he should call *Ag.* (*Pholiota*) *cookei*, and it was figured under that name. Afterwards I found the specimens figured on pl. 349 at Chingford, and these I called *Ag. terrigenus*. Anyone comparing the two plates will I think come to the conclusion that both are really the same species, notwithstanding the slight differences.

As far as I can make out, my original suspicion has been confirmed and endorsed, that *Pholiota comosa* and *P. heteroclita* at least, as far as we know them, are but two names for the same species. Compare plates 366 and 600.

Somehow the names of *Ag. fimiputris* and *A. phalœnarum* got exchanged on the plates, so that they need correcting.

Although I am jumping from one end of the book to the other in these remarks, I must not forget to call attention to what is now called *Amanitopsis vaginata*, which is very common in the Epping Forest. There are three very well marked forms, the most common being of a greyish colour, and has been named *livida*. I have eaten this and found it to be very delicate and digestible. The same can be said of the more scarce white variety, the *nivalis* of Greville. The last of the three forms is bright brown, and has been known both as *spadicea* and *fusca*. This is, I consider, entitled to rank as a distinct species I tried to eat it once, and I do not intend to try it again, and I am bound to caution all persons concerned that it is not good to eat. For this, as well as other reasons I suggest that we should mark the difference in future, by calling the brown form *Amanitopsis fusca*.

There are two species of *Hygrophorus* figured, one of them called *H. lætus* (pl. 938) and the other *H. houghtoni* (pl. 936), but I cannot find any difference between them. It has not been uncommon in Epping Forest, whichever name has been given, but I think that *H. houghtoni* must be dropped.

1 See description of this species by Dr. Cooke, *ante.*, page 127.—Ed.

I have been informed recently, that the curious *Lactarius obliquus* has been found, and is to be recorded for Epping Forest. I am very glad of this, because no one but myself ever found it previously in this country, and I am confident its determination was looked upon with suspicion, in some quarters. It is the only species of *Lactarius* we have with a lateral stem.

Now we come to the great sphinx which has been the major conundrum for years, and I do not intend, or pretend, to solve it. Of course it is represented by *Hypholoma lacrymabundus* and the supposed *Agaricus storea*. Let anyone who pleases hunt up all the pages that have been written, but I shall not quote them here. I am convinced that M. J. B. led me into error in assuring me that what I figured as *H. lacrymabundus*, was that species according to Fries. I am now satisfied, for several reasons, that it was not, and was doubtless only a form of *H. velutinus*, with a scaly, instead of a silky pileus. The next point is this—what is the fungus which has been called here *Agaricus storea*? and figured as such in the *Illustrations*. It is very certain that it is not the *Agaricus storea* of Fries., whatever else it may be. At present I do not feel quite satisfied that it is the veritable *Hypholoma lacrymabundus* of Fries. I cannot swallow the whole pig at once.

Pl. 703 which was sent to Fries, also with fresh specimens, was declared by him to be *Cortinarius saginus*, and was published under that name. Doubtless it was a lapse of memory on the part of the author, since the figure is only *Cortinarius triumphans*, yet perhaps not quite typical, as the stem in the figure does not "imitate a triumphal column" neither is it encircled by tawny scales, disposed in numerous circles or rings. This is depicted better in plate 692, than in pl. 703, which latter has been characterised as "one of the best figures in Cooke's *Illustrations*." However critics are sometimes permitted to make mistakes, to prove themselves human.

Cortinarius torvus has long been a bogie to most of the Continental mycologists, who certainly have fallen into error in regarding *Cortinarius berkeleyi* as the genuine *Cortinarius torvus* of Fries. The figure in Fries' *Icones* is quite enough to show that there is no affinity between them

I ought to feel extremely grateful for your kindness this evening in listening to me so patiently, more so than ever, because I have done so little to deserve it, except to bore you and tantalize you with the most uninteresting and unattractive paper I ever had the effrontery to read before you. My only excuse is that it had to be done. Some victims had to be found, and I hoped you would be good natured ones, and in this I have not been disappointed.

[Dr. Cooke continued his address in the form of one of his humorous analyses of the persons attending "Fungus Forays," especially urging the value of the social element of such gatherings.—ED.]

NOTES ON A MANGANIFEROUS SEAM IN THE THAMES VALLEY DRIFT AT ILFORD, ESSEX.

By J. P. JOHNSON.

The continued erection of houses on the site of the old Uphall Brickyard has necessitated the opening of several new pits for the supply of building material, since those described in an earlier paper[1] were filled in. As a rule the sections thus exposed shew no additional features of interest and further back attraction in that they have not yielded any fossils.[2]

However, there are exceptions to every rule and the following section which is situated between the "Hunter," "Uphall" and "Harvey Roads," is well worth noting:—

Fine Ochreous Gravel	..	4 ft.
Ochreous Sand ..	..	3 ft.
White Sand ..	..	1 ft

For between the gravel and sand, which pass into one another, there is a lenticular seam coloured black with hydrated oxide of manganese, which occurs in the amorphous form of psilomelane, coating the grains and pebbles.

I took three samples from different parts of the seam with the object of determining the percentage of manganese present. Sample i. was estimated by my friend, Mr. W. G. Rumbold, to contain 2·7 per cent. Sample ii., which was kindly analysed by my friend Prof. Geo. Patchin, A.R.S.M., and by Mr. F. A. Zurcher, yielded ·975 per cent., while sample iii., which was assayed by myself, contained only ·68 per cent. All three samples were assayed gravimetrically by the "basic acetate" process, and very carefully checked by duplicate assays.

It will be seen that the results vary somewhat, but their difference is not greater than might have been expected from the nature of the deposit, because, since the psilomelane occurred only as a film on the exterior of the pebbles and grains, the sandy portions of the seam would naturally contain more manganese than the pebbly portion.

1 J. P. Johnson, "Additions to the Palæolithic Fauna of the Uphall Brickyard, Ilford." Essex Naturalist, vol. xi. (1900), pp. 209-215.

2 I have, however, obtained the greater part of a large hâche which I have handed over to the Essex Field Club's Museum at Stratford. It is very much abraded and is probably derived from the high-level drift of this valley.

Like the rest of the gravel, the manganiferous seam contains a quantity of oxide of iron. The amount present in sample ii. was determined by Mr. Zurcher to be 2·7 per cent., while that in sample iii. was estimated by myself as 2·5 per cent. One would expect the amount of iron in the different samples to be more uniform than the manganese, as, while the latter is on the outside of the pebbles only, the former occurs inside as well, which also explains why the psilomelane, though really present in smaller quantity than the oxide of iron, should nevertheless give the colouration to the seam.

The psilomelane was clearly deposited contemporaneously with, and must have been brought down by the river (Thames) which deposited, the drift in which it occurs. But there are no ores of manganese in the rocks over which the Thames and its tributaries flowed. Nearly all iron ores, however, contain a minute proportion of manganese, and it is from these iron ores, of which there are plenty in the Thames Basin, that the manganese has been derived. It is quite easy to understand how the manganese was taken into solution together with the iron and precipitated separately at places where the conditions were favourable.

During the recent excursion of the Essex Field Club to the excavations in Tottenham Marshes, in the Lea Valley, I noticed an extensive manganiferous seam, in the sections in the Palæolithic gravel over-looking the new reservoirs.

A good test for the presence of manganese in any material is to fuse it with sodium bicarbonate, to which it imparts a green colour.

P.S.—Since writing the above Mr. Cole has drawn my attention to an interesting paper by Mr. T. S. Dymond, F.I.C., on the occurrence of manganiferous conglomerate in gravel at Tendring (ESSEX NATURALIST, vol. x. (1897), pp. 210-12), in which another explanation is given of the derivation of the manganese. The conditions under which the deposit occurs at the two places would, however, appear to be very different.

MANGANIFEROUS NODULES IN THE BOULDER-CLAY OF ESSEX.

By [MISS] MAY THRESH.

[*Read December 14th, 1901.*]

Some time ago it was remarked that in certain soils in Essex there occurred small nodules which in appearance bore so close a resemblance to seeds that they were almost indistinguishable *in situ*. It was observed that these nodules were only found in soil overlying the Essex boulder clay. They are brown in colour, often almost a perfect sphere in shape, and very hard. In size they vary considerably, the largest being about five millimeters in diameter and the smallest exceedingly minute.

A sample of the soil containing these nodules was taken; they were carefully sorted out and weighed, and it was found that they formed about ·1 per cent. of the total weight of soil examined. The nodules were then submitted to a qualitative analysis and were found to contain iron in considerable quantities. It was noticed on the addition of hydrochloric acid that chlorine was given off, proving the unexpected presence of the peroxide of manganese. On separating the insoluble part from the soluble filtrate it was seen that the former consisted of a sandy whitish residue of silica.

The presence of manganese dioxide rendering the nodules of greater interest, a quantitative analysis was made. The substance was first powdered and a weighed portion was heated to 200° C. in order to drive off any water present and determine the percentage of moisture. The dried substance was then digested with strong hydrochloric acid and the metallic compounds were thus separated from the insoluble silica, which was dried and weighed. The soluble portion containing the chlorides of the metals was next neutralised with ammonium carbonate and the iron was precipitated by means of ammonium acetate, washed, dried, and weighed as ferric oxide.

The manganese left in the filtrate was precipitated by means of ammonia and a saturated solution of bromine water, dried, and weighed as manganese tetroxide. The calcium left in the filtrate was precipitated by ammonium oxalate, dried and weighed as lime.

The manganese peroxide was estimated in the usual manner. The weighed substance was placed in a small flask with some hydrochloric acid and heated. The chlorine given off was led through some bulb tubes containing potassium iodide solution and the amount of iodine liberated was estimated by deci-normal thiosulphate solution.

Later, a second sample was taken and subjected to a similar analysis. The following are the percentage results of the examination of the two samples :—

	1	2
Moisture	7·00 ..	5·60
Silica	47·90 ..	51·86
Oxide of iron	29·91 ..	23·89
Manganese peroxide ..	5·12 ..	9·35
Manganese protoxide ..	3·44 ..	2·07
Calcium oxide	2·45 ..	3·54
Phosphates, carbonate, &c.	4·18 ..	3·69
	100·0 ..	100·0

From the above figures it will be seen that the nodules differ in composition, some being richer in manganese, and the manganese being in some in a more highly oxidised condition than in others. The nodules appear to be formed of a silicious material cemented together by the oxides of iron and manganese with some phosphate and carbonate of calcium and a quantity of moisture varying in proportion to the iron present, since 5·6 bears the same ratio to 23·9 as 7 does to 29·9.

It is remarkable that the manganese protoxide and lime in the first sample are exactly *equivalent* to the protoxide and lime in the second sample, in fact, the two oxides have evidently been able to replace each other in the nodules.

This somewhat remarkable material has a great similarity to that already described to the Essex Field Club in a paper read by Mr. T. S. Dymond at the meeting held Dec. 11th, 1897 (Essex Naturalist, Vol. X., pages 210-12).[1] This paper referred to the hard masses of cemented gravel found in some parts of Essex, chiefly round Tendring, and which were used for building purposes. The cement proved to be "ferric oxide mixed with the peroxide and protoxide of manganese, together

1 Reference should also be made to the paper by Mr. Johnson on a Manganiferous Seam in the Drift at Ilford, printed in the present part of Essex Naturalist, which was received by the Editor previous to the reading of Miss Thresh's paper.—Ed.

with a large quantity of sand." It is possible that the two materials have a similar source; both are found only in soils overlying clay and which contain chalk. Probably an abundance of chalk is necessary for the formation of the nodules, as it is well known that whereas in the presence of acids manganese exists in its stable compounds in the manganous state, in the presence of alkali it becomes oxidised and forms the manganic compounds. Therefore in an alkali or chalky soil alone could nodules or cement, in which manganese exists as the peroxide, be formed. Manganese peroxide is usually found, as in these cases, associated with ferric oxide and the lower oxide of manganese.

The following may be the explanation of the occurrence of these nodules:—Surface soil contains the silicates of iron and manganese, but these are decomposed by the soil acids, and salts of iron and manganese are formed in solution. In the presence of an alkali these salts decompose and precipitate the oxides of the metals. At the same time the manganese being in the condition of a free oxide would become more fully oxidised by the action of the air in the soil. To prove the truth of this supposition a solution of manganese sulphate was taken and on the addition of ammonia or other alkali, oxidation at once took place in the presence of air, the white precipitate first formed becoming brown, and in the course of 24 hours almost black. This precipitate on examination was found to consist partially of the higher oxide of manganese liberating chlorine from hydrochloric acid. The slightest acidity, even that caused by excess of carbonic acid in the solution, was sufficient to prevent this oxidation even when so powerful an oxidiser as hydrogen peroxide was employed. This precipitation may resemble crystallization, in taking place from a particular point, and the sand adhering to the growing particle would become cemented up into the nodule.

[At the reading of the paper, Mr. T. S. Dymond, F.I.C., F.C.S., made some remarks, which are printed as follows in the form of a Note:—

Manganiferous nodules are not infrequently met with on the bed of the deep sea. They have been found near the Canaries, to the south west of Australia, in the Northern Pacific Ocean and elsewhere. These nodules are said to have the appearance of urinary calculi, are brown in colour and have a structure shewing superposed layers of clay. Analysis shews that they consist chiefly of the oxides of iron and manganese, the latter peroxidized,

together with silicate of alumina and combined water, and minute quantities of other materials. The best account of these marine nodules with drawings occurs in M. J. Thoulet's *Oceanographie*, 1890.

Both in appearance and composition it is clear that the nodules described by Miss Thresh have the closest resemblance to these marine nodules. This suggests a common origin and that the former were not formed *in situ*, but that during the ice age they were picked up by floating icebergs from the sea bottom along with other material and transported to and deposited in their present position. This being so, their occurrence in the Boulder-clay and not in the London-clay soils is owing, not to the necessity of chalk for their production as suggested by Miss Thresh, but to the fact that the Boulder-clay is a glacial deposit and the London-clay is not.

The explanation given by Miss Thresh of the formation of the nodules is that which has been advanced by Dieulafait (*Comptes Rendus*, 1883, p. 718) for those of marine origin, who states that solution of manganese carbonate exists in sea water and that this is attacked by the dissolved oxygen with liberation of carbonic acid gas and deposition of manganese peroxide.

The importance of the matter lies in the fact that if the nodules are of marine origin, valuable light is thus thrown upon the source of the Boulder-clay in which they occur.

T. S. DYMOND.

[*County Technical Laboratories, Chelmsford, December, 1901.*]

THE CORRESPONDING SOCIETIES COMMITTEE OF THE BRITISH ASSOCIATION, GLASGOW, 1901.

REPORT OF THE CLUB'S DELEGATE,

F. W. RUDLER, F.G.S., *Chairman of the Conference.*

The Lecture Theatre of Medical Jurisprudence, in the University Buildings, was placed at the disposal of the Delegates throughout the Association week. Two meetings of the Delegates were held here—one on Thursday, Sept. 12th, and the other on Tuesday, Sept. 17th. The Chairman at these Conferences was the delegate of the Essex Field Club, Mr. F. W. Rudler; the Vice-Chairman was Mr. W. Whitaker, F.R.S., and the Secretaries were Dr. J. G. Garson and Mr. A. Somerville. The meetings were well supported, no fewer than 42 societies having sent delegates.

The Chairman opened the proceedings with an informal address, in which he suggested the local societies should regard it as part of their duty to seek, register, and record in a systematic

manner all types and figured specimens of natural history objects within their respective spheres of influence; and he urged the propriety of extending such work to pre-historic antiquities.

[Some of Mr. Rudler's suggestions were so pertinent to the case of our own Club, that we cannot refrain from quoting in full two or three passages from the address which his modesty has led him to summarise in a few lines. Referring to the important question of the registration of type-specimens, he remarked:—

"So far as concerns the types which are preserved in provincial museums it may be said, probably, that the work should be done either by the museum itself or by that excellent institution, the Museums Association, an association which has recently increased its usefulness by the issue of a monthly journal, which I may commend to the attention of local societies. It is true that some of the larger museums have already published, or are now engaged in publishing, lists of their type-specimens, or at least certain classes of types. But most museums fail to possess the means of carrying out such work and properly publishing the results, and therefore could hardly resent the interference of a local Society. Moreover a museum could not be expected to take cognisance of specimens in private hands, whereas a committee of the local scientific society could make it its business to seek out all the type-specimens within its sphere of influence, whether in the local museum or in private collections, and could give permanence and publicity to the information thus acquired by printing the schedules of types in its proceedings."

Mr. Rudler proceeded in this connection to make a valuable suggestion for local work, and one that is quite within the powers, as well financial as scientific, of most societies:—

"The same kind of research might, in my opinion, be extended with advantage to local antiquities, at least to those of pre-historic age. Each society might fitly publish lists of the antiquities which have been discovered within its own district, and which have been described and figured. Where the specimens remain in private hands, it is often difficult, and sometimes impossible, to trace them, but no one is likely to be more successful in the search than the members of the local society. The advantage of knowing, when working at any particular subject, where the original specimens are located is so obvious that I venture to hope that the Delegates may see their way to urge the societies which they respectively represent to move in the direction which I have indicated."

Many of those connected with local societies have been almost appalled by the multitudinous schemes of work which have from time to time been put forward by the Committee. Mr. Rudler made some observations anent this matter which are well worthy to be kept in mind:—

"It seems to me doubtful whether it is desirable to suggest at this Con-

ference many new lines of work to be taken up by our local societies. In most cases they already possess programmes which are pretty heavily weighted, some societies perhaps undertaking even more than they can satisfactorily accomplish; and I believe it would probably be better in most cases to systematise and improve the existing work than to attempt the introduction of new departments of study. The governing body in each society might well be charged with the duty of seeing that the work is worthy of the present position of science. The steady growth of scientific education in this country during recent years ought to tell most favourably upon the character of our local societies. New members come prepared with a groundwork of scientific training unknown to most of the older members at the time they entered, and as a consequence the work of the society should be lifted to a higher level than that on which we were formerly content to let it rest. It is satisfactory to note that in many cases this has been thoroughly realised, and indeed a review of the proceedings of the various local societies at the present day shows that a high standard of excellence is often attained."—ED.]

The Rev. J. O. Bevan, M.A., read a paper in support of the following resolution :—

"That the Committees of the Corresponding Societies be invited to lay before their members the necessity of carrying on a systematic survey of their counties in respect to ethnology, ethnography, botany, meteorology, ornithology, archæology, folklore, &c."

In the course of his communication he spoke as follows :—

"It is hereby suggested that the Conference of Delegates should select one or more subjects of pressing interest, and undertake to bring before the respective societies the advisability of undertaking systematic work (each in its own district) in these directions. The affiliated societies, through their Delegates, would be expected to make a return of the results—partial or complete—at the ensuing meeting of the British Association.

In the choice of subjects three considerations (at least) present themselves :—

(a.) They should be of a general kind, capable of being worked up by the local societies in their respective districts.

(b.) Preliminary arrangement should be arrived at whereby may be determined the lines and limits of investigation, the mode of tabulation of results, the scale of chart or map, the scheme of symbolical representation, coloration, nomenclature, conventional arrangement of detail, the method, form, size of publication, and the like.

(c.) A special society or expert should be indicated as ready to advise in regard to each of the particular subjects.

"The ends to be gained are these : The taking stock of all facts by a connected series of methodical surveys; their registration before the corroding effect of time, the amalgamation of race, or any other cause, puts it beyond the reach of effort; the full completion of surveys already begun; the setting forth of results in a manner directly susceptible of useful comparison. A collateral advantage would be the discovery of a considerable amount of work

already elaborated, and (with necessary revision and reduction to the common scale) its inclusion in the General Survey.

"A beginning or an extension of past work might be made in respect of:—

Meteorological and seismological phenomena.
Life zones.
Registration of type specimens.
Photographs of sections; records of well-borings, &c.
Phenomena of glaciation; erratic blocks.
Origin of lakes; changes of area and depth.
Coast and river erosion.
Pond, cavern, and underground life.
Ethnographical, ethnological, and archæological surveys.
Botanical survey, to include fungi and algæ.
Phenological observations.

"It will be understood that this list is provisional, but it is selected by reason of the fact that the field has been already entered upon, and that little further organisation is needed.

"The Conference will make it clear that there is no intention to dictate to the various Societies involved. The suggestions are tentatively put forth in the interests of scientific research, and in response to the demand frequently made by Delegates. Each Society will consider the matter, and, in its wisdom, deal with the subject which seems the more nearly to come within its purview."

Mr. Bevan's communication gave rise to prolonged discussion and resulted in the appointment of a small committee of Delegates for the purpose of formulating a scheme for systematising and co-ordinating the work of local societies. This Committee was appointed at the instance of Prof. W. W. Watts, and at the second Conference the Report was submitted to the Delegates and adopted. The recommendation of the Committee was as follows:—

"The following provisional list of subjects, together with the names of some of the Societies which have already done work in connection therewith, and the names of persons who would be willing to receive communications thereon, is recommended by the Conference of Delegates for adoption by the Corresponding Societies Committee of the British Association, and to be issued by them to the Corresponding Societies in the hope that those societies not already engaged in similar work may take part in so much of it as comes within their scope, in order that the work may be extended over a wide area, and be done as far as possible upon a uniform system.—

'Registration of Type Specimens,' Dr. A. Smith Woodward.

'Coast Erosion,' Mr. W. Whitaker.

'Record of Bore Holes, Wells, and Sections,' North of England Institute of Mining and Mechanical Engineers, and Prof. J. H. Merivale.

'Tracing the Course of Underground Water,' Yorkshire Geological and Polytechnic Society, and Mr. A. R. Dwerryhouse.

'Erratic Blocks,' Yorkshire Naturalists' Union, and Professor P. F. Kendall.

'Geological Photographs,' Belfast Naturalists' Field Club, and Professor W. W. Watts.

'Underground Fauna,' Rev. T. R. R. Stebbing.

'Variations in the Course of Rivers and Shape of Lakes,' Dr H. R. Mill.

'Archæological Survey by Counties,' Woolhope Field Club, and Rev. J. O. Bevan.

'Ethnographical Survey,' Anthropological Institute.

'Botanical Survey by Counties,' Mr. W. G. Smith.

'Photographic Record of Plants,' Mr. A. K. Coomara-Swamy."

In the course of discussion at the first Conference, Dr. Vaughan Cornish suggested that a Report should be presented each year, explaining what had been done by local societies in carrying out suggestions made at the preceding Conference. This appeared to be the general desire of the Delegates; and at the second Conference Captain Dubois Phillips, R.N., moved the following resolution, which was carried unanimously:—

"That the Corresponding Societies Committee be requested in future to bring before the Conference of Delegates some account of the outcome of the Conference of the preceding year."

Representatives of most of the Sections of the Association attended the second Conference and explained the kind of work in which their respective Committees might be assisted by local societies. Prof. Watts called attention to the valuable work carried on year after year by the Committee on Geological Photographs; Prof. Percy Kendall explained the work of the Committee on Erratic Blocks. Dr. Vaughan Cornish pointed out the kind of investigations on Limnology which might be carried on by societies located in the neighbourhood of lakes; Mr. Henry Balfour advocated the collection of photographs of anthropological and archæological interest, and enlarged on the value of observing and recording the survival of primitive customs, &c.; Mr. Harold Wager suggested that assistance might be given to the Committee for investigating the structure of blue-green algæ, as also to that appointed to collect, preserve and systematically register photographs of botanical interest; Prof. Dalby referred to Committees of the Mechanical Section on Screw-threads and on Road Traction, which might possibly receive local assistance; and Prof. McLeod explained that a Committee of the Chemical Section would be glad to hear of the

names of scientific chemists who are at work at different manufactories, with the view of ascertaining the extent to which trained chemists are employed in British industries.

It will be seen from the foregoing sketch that the meeting of the Delegates at Glasgow led to certain definite results, which it is hoped may tend to improve the work of some of our local scientific societies.

ANENT A FOREST LODGE IN 1444.

By W. C. WALLER, M.A., F.S.A.

On several occasions short articles on the Forest Lodges have appeared in the ESSEX NATURALIST, and when, a short time ago, an ancient document referring to one of them chanced to pass through my hands, it occurred to me that it might most conveniently make a public appearance in the pages of the same serial.[1]

It so happened that Mr. St.Clair Baddeley, a prominent member of the Bath and Cheltenham Archæological Society, in examining some ancient MSS. belonging to a Gloucestershire neighbour, Mr. Hyett, came upon a small, stout volume, in a 15th century hand, which seemed, on a cursory examination, likely to prove serviceable for Essex history: and with that in view he courteously and most kindly opened communications with an official of the county society. When the book ultimately came to me for examination I found that, so far as Essex was concerned, its contents, as a whole, failed to bear out the rich promise of its earlier pages. The first of these—it had no title page—proved to be the beginning of a copy of the Perambulation of the Forest of Essex made in 1301, of which a translation is given in Mr. W. R. Fisher's *Forest of Essex*. One or two other documents of like nature, relating to parts of the same Forest, followed, and then the volume gradually revealed itself as a handbook of legal practice, precedents, and formulæ, some manorial and some forestal. Of these latter a few were interesting, as furnishing details of procedure, and that of which I am about to give an English version, relates to Essex. Whether or no the original document provided the initial stage in the erection of what is to-

1 ESSEX NATURALIST, vi., 206; vii, 82; ix., 166; xi. 153.

day known as 'Queen Elizabeth's' Lodge—a building already, from internal evidence, assigned to the century previous to that in which she lived—or to one at Stratford, Hainhault, or elsewhere, there is unfortunately no means of determining. But, however that may be, it is still interesting to know definitely how, and when, and why, one of these lodges came into being, and the means adopted to raise money for its construction.

The warrant for the proceedings issued under the hand of Humphrey, Duke of Gloucester. His 'quality,' more or less pompously set out between his name and his titles, sums up his relationship to the three Henrys who ascended the English throne in succession. His name does not occur in the list of Wardens furnished by Mr. Fisher, whose enumeration leaves blank the years between 1379 and 1489; and the name of one Steward of the Forest of Essex is separated by a like gap from that of the next mentioned by him.[2] Thus much having been said by way of introduction, the document shall be left to speak for itself.

Humphrey, the son, brother, and uncle of kings, Duke of Gloucester, Earl of Pembroke, &c., and Chief Warden of the Forests of my Lord the King on this side Trent, to the Steward of the Forest of Essex, or his Lieutenant in the same, greeting. Since lately, at the last Session of the said Forest, held before us, it was found and presented that there is not in the said forest any lodge [*logia*] for the convenience of the ministers [*ministrorum*] of my Lord the King of the same forest, which was very necessary and convenient for them; nor any pound [*pimfold*] for impounding and keeping cattle, swine, and sheep, trespassing within the said forest, or strays coming into the same; which cattle, swine, sheep, and strays, and other forfeits, albeit they were seized for the lord King, have, owing to the lack of this custody, for a very long time continually got away, and do daily get away, to the no small damage of the same my lord the King, for which we desire, as we are bound, to provide a remedy. Wherefore, on the part of the said my lord, we charge you that, by view of the Verderers and of two or three of the Regarders of the said Forest, you cause to be newly constructed and suitably raised without delay a lodge and a pimfold, within the said Forest, on the soil of the same my lord the King, and that you take so much of the wood, underwood, and brushwood from the wood of my said lord the King as may be necessary for the timber of the said Lodge and Pimfold, and the construction of the same; and also of one pair of stocks for the punishment of evildoers in the Forest; and also that you, by view of the aforesaid Ministers within the same Forest, take oaks to be exposed for sale wherever you see that they may be best taken for the advantage of the same my lord the King, so as the said wood of my lord the King may be able to bear without waste; [and] that you cause to be felled and sold so much as is necessary, sufficient, and opportune, for the new

2 *The Forest of Essex*, pp. 110, *et seq.*

construction thereof, making indentures between yourself and the aforesaid Ministers concerning the sale aforesaid. And you shall an account render of the sale and repair aforesaid before us or our Lieutenant at our next coming to the Forest aforesaid, or in the interval elsewhere, whensoever you shall be called upon.

Given at London, on the 4th day of December, in the 23rd year of the reign of my said lord the King, Henry, the Sixth after the Conquest. [1444.]

THE ESSEX FIELD CLUB.

SATURDAY, APRIL 13TH, 1901.

A circular had been issued by the Secretary calling a "Field Demonstration meeting" this afternoon; subject, the observation of mosses in their forest stations. Mr. E. M. Holmes, F.L.S., was the "conductor." But the day turned out a depressingly wet one, and only Mr. Holmes, Mr. E. S. Salmon, F.L.S., Miss Read, the Hon. Secretary, and Mr. H. A. Cole faced the steady downpour of rain experienced in the walk from Chingford to High Beach, the appointed *rendezvous*. Mr. Holmes and Mr. Salmon collected and determined several mosses and lichens under the imperfect shelter of umbrellas. But even the enthusiasm of the brave little party faded somewhat before Monk Wood was reached; they sought refuge in the "Wake Arms" and took possession of the tea ordered for the Club. The ORDINARY MEETING appointed, and indeed all formal business, was necessarily postponed.

FOREST RAMBLE AND DEMONSTRATION MEETING.

SATURDAY, MAY 18TH, 1901.

The weather at this spring ramble compensated in its brightness and warmth for the dismal meteorological conditions of the preceding one. It was intended to allow of an inspection of some parts of the Forest which have been thinned by the Conservators in recent years, so as to afford a demonstration of the effects of this treatment.

The "Conductors and Referees" were Prof. J. B. Farmer, M.A., F.R.S. (*Professor of Botany, Royal College of Science*), Prof. H. Marshall Ward, D.Sc., F.R.S. (*Professor of Botany, University of Cambridge*), the President (Prof. Meldola), and the Hon. Secretary.

Mr. E. N. Buxton, Verderer, and Sir Fowell Buxton, Verderer, had intended to be present to point out and explain the work which had been done, but most unfortunately as they were awaiting the party at the foot of Oak Hill, Theydon, Sir Fowell Buxton was knocked down by a bicyclist and though happily it was found that he was not seriously injured, both he and Mr. E. N. Buxton were necessarily absent from the meeting.

The main party met at Theydon Bois Station at 2.25, and the route led through the Theydon High Woods, Epping Thicks, Ambresbury Banks (where Mr. W. Cole gave a short address on the construction of these earth-

works and on the facts as to their probable date ascertained during the Club's explorations in 1881) and so on to Monks Wood. There, by the kind permission of Mr. McKenzie, the Superintendent, a tent had been erected under the shade of the beeches, in which tea was served.

Full opportunity was taken during the ramble to demonstrate to those interested the effect of the thinning operations, and, by way of contrast, the condition of a few acres of woodland which had been left very much in their early forlorn condition, as an object lesson for those who ask for an "unimproved" forest. Many of those present were much struck with the abundance of young seedling oaks, beeches, hornbeams and hawthorns which were to be seen in many places. But it was pointed out that almost all these were doomed to destruction by the cattle (and perhaps the deer, which are certainly now too numerous) and that the prospect of the forest renewing itself, unless some very drastic measures were taken to preserve and encourage the growth of these seedlings, was extremely doubtful. The old pollards are dying off—and a constant uprearing of vigorous young wood is the thing above all others to be desired.

After tea, a short ORDINARY MEETING (the 203rd) was held in the tent, the President in the chair.

The following were elected members of the Club:—Mr. Harold L. Barnard, Mr. John Boardman, Mrs. Boardman, Mr. P. Anderson Graham, and Mr. J. Thompson.

Prof. Meldola expressed the regret of all present at the lamentable accident which had befallen Sir Fowell Buxton, which had deprived them of the pleasure and benefit of his presence and that of Mr. E. N. Buxton.

At the request of the President, both Prof. Farmer and Prof. Marshall Ward gave short addresses on the state of the Forest as it had come under their observation that afternoon—and both emphatically insisted on the necessity of some steps being taken to insure the growth of young trees, so that the forest might be renewed in the years to come.

The President also made some remarks on this subject, and proposed that a cordial vote of thanks should be passed to Prof. Farmer and Prof. Marshall Ward for their attendance and the addresses they had made.

Sir Frederick Young, as an old friend of the Forest, and as one who had known it in the days long before it had come into the hands of the Corporation, expressed his pleasure at the improvement manifested. He warmly congratulated all present, and indeed all residents of the London district, upon the magnificent heritage upon which they had entered. He seconded the votes of thanks, which were carried by acclamation.

The walk back was over the Furze Ground, by Broadstrood Lodge, and through what was formerly "Oak Hill Enclosure," and over Theydon Green to the station.

THURSDAY, JUNE 6TH, 1901.

The Conference Meeting and visit to Dunmow and Bigod's, held this day, is reported under a separate heading in the present part (p. 157).

VISIT TO CANVEY ISLAND, ESSEX.

SATURDAY, JUNE 15TH, 1901.

This meeting was planned to continue the survey of Canvey Island, following up that held on June 30th last year (see report in ESSEX NATURALIST, Vol. xi. pp. 261-264, where a sketch of the geology of the district by T. V. Holmes, F.G.S., will be found). On the former occasion the island was approached from the sea front, but on this, the assembling-place was the old village of Benfleet, and the time, noon.

The conductors were Dr. James Murie, LL.D., F.L.S., Prof. G. S. Boulger, F.L.S., the President, and the Hon. Secretary. The tide was up at Benfleet, and the party was ferried across by the old boatman. Some of the party walked through the island; others were carried in a very primitive cart which had been hastily fitted up for their accommodation. During the ramble the botanists and entomologists were busy determining the plants and insects met with. Caterpillars were plentiful and *Clisiocampa lanestris* and *C. neustria* were again met with commonly. The fine large larvæ of *Gastropacha quercifolia* were found on the blackthorns, and the pretty caterpillars of *Trichiura cratægi* were seen. On the grass, the handsome larvæ of *Bombyx quercus* were often observed. Members of the party had brought luncheons with them, so that no time was lost in getting on to the sea wall. It was a very regrettable sight to find Canvey in the hands of the speculative land-jobber—most of the island bordering the estuary is being parcelled out in small plots, for the erection of bungalows, and the prospective creation of a "Canvey-on-Sea." We fear that Canvey, as a locality for many good insects and uncommon seaside plants, is doomed to be "improved away."

On the coast the botanists found ample employment. The characteristic and deeply interesting maritime plants afforded Prof. Boulger texts for short demonstrations. The beautiful Yellow-horned Poppy (*Glaucium luteum*) was in abundance, but will probably soon be a joy of the past in view of the tribes of children invading its sandy haunts. Dr. Murie pointed out the salient features of the geology of the coast line, particulars of which were amplified in his address delivered later in the afternoon.

Many members came down by a later train, and quite a large party gathered for tea in one of the more spacious bungalows, the caterers being the "Hoy" Inn, Benfleet.

Afterwards a meeting was held, Prof. Meldola, President, in the chair.

Prof. Boulger gave a short address on "Estuarine Flowering Plants, with special reference to the coast of Essex" the main substance of which is embodied in the paper on "Sea-side Plants" printed in the present part (*ante* pp. 125-27).

Dr. Murie delivered, *vivâ voce*, an address on "Canvey in its relation to the Thames Estuary and marine life around." [Dr. Murie has promised to prepare the substance of this most interesting address as a paper for the ESSEX NATURALIST, but pressure of other work has delayed this up to the time of going to press.]

The President made some remarks on the subjects taken by both

speakers, and Prof. Boulger and Dr. Murie were warmly thanked for their addresses and for the trouble they had taken during the day to render the meeting pleasant and profitable.

The archaic cart was again requisitioned by some of the party back to Benfleet, while others (more wisely) walked, and collected insects and plants by the way.

VISIT TO THE EXCAVATIONS AT THE EAST LONDON WATER COMPANY'S NEW RESERVOIRS, TOTTENHAM AND WALTHAMSTOW.

SATURDAY, JUNE 29TH, 1901.

At the kind invitation of Mr. Charles W. Sharrock, the Superintendent of Messrs S. Pearson and Son's works at the new Storage Reservoirs, a very interesting meeting was held on this afternoon, and its announcement attracted a large assembly of members and friends The party was met at the gates of the works in "Ferryboat Lane" by Mr. Sharrock and Mr. Traill, his assistant, and by Mr Marsh, the Assistant Engineer of the Water Company. Col. Bryan, the Chief Engineer, was unavoidably, and at the last moment, prevented from being present.

A locomotive, with three trucks fitted with seats, took the party over the bed of the new reservoirs, and at various points Mr. Sharrock explained the engineering aspect of the works, the diversion of the old river Lea from its channel and the formation of the new water-way. He mentioned incidentally that there was plenty of water in the river, and if the new reservoirs did not prove adequate, it was proposed to construct others higher up the Lea valley. Owing to Mr. Sharrock's excellent arrangements the sections exposed throughout the extensive works were inspected without fatigue.

Mr. T. V. Holmes, F.G.S., demonstrated the points of geological interest—the sections of the Lea alluvium, the shell-marl and peat, and remarked, in the first place, on the unique interest of the sections exposed in making the new reservoirs. Probably to the geologist the most interesting sections were those of new railways. Railway cuttings, however, in soft strata, were liable to be speedily spoiled as geological evidence, both by the ordinary action of the weather, and by the practice of sloping them. Still they were there, though latent, and liable to be re-disclosed whenever a widening of the line became necessary. But sections such as those before them were such as railways never revealed; for railways never made cuttings through marshes, though they often crossed them by means of embankments or viaducts. Then the sections made during the formation of those reservoirs would not be simply sloped, but would be swept out of existence, the completion of the reservoir implying their annihilation. As to the nature of the beds displayed there and their mode of formation; they were simply the work of the river Lea. Rivers had a way of perpetually tending to erode their banks on one side and to deposit material on the other, the bank on which erosion was taking place at any given spot, being the bank

which was gaining through the deposition of material a few yards, or a few hundred yards, higher up or lower down the stream. In this way a river flowed, at one time or another, over every square foot of ground occupied by the marshes adjacent to it. As to the nature of the strata found in these alluvial or marsh sections, gravel was always seen towards their base and loam at their surface, and sometimes they were the only beds visible. But in other places, between the gravel and the loam were mud, peat and irregular deposits of shell-marl. Sections there showed how very frequent had been the changes of channel in certain spots, as compared with others. Thus human relics or other remains found, which had evidently been deposited in an old channel at one spot, might easily be hundreds or even thousands of years older or newer than others similarly deposited but a few yards away. The dug-out canoe, for example, seemed to him to be more likely of greater rather than of less antiquity than the year B.C. 500. The supposed Viking ship—if not of much later date—was perhaps a vessel of the Danish fleet blockaded up the Lea by King Alfred in the year A.D. 896. Sections of this kind also threw much light on the way in which the older river deposits, now existing as comparatively obscure fragments, had been formed, a matter on which more light certainly seemed desirable in view of the very discordant opinions expressed by various geologists about them and their fossil contents.

[Reference should be made to Mr. Holmes' paper in the last part of the ESSEX NATURALIST, *ante.*, pp. 1-16].

The remains of the so-called "Viking Ship," which had been uncovered in what at one time had been a backwater in the old river channel, were inspected with much interest. Some archæologists of the party were, however, unwilling to allow for this relic the antiquity suggested by Mr. Holmes in his remarks above quoted, and in his paper (*ante.*, p. 13), viz., that it might have been a member of the Danish fleet which went up the Lea in A.D. 895 and was destroyed by King Alfred. The "ship" was found with the bottom upwards, and was in a very decayed state. It was probably about 40 feet long, and what is called "clinker-built," with metal nails, and in some places the remains of hair (? cow) were found, probably used in caulking the boat.

The information concerning the ship was very meagre, and it was most unfortunate that nothing but fragments could be kept; several pieces are in the Epping Forest Museum. To preserve the boat properly would have been a difficult and costly work, and its great size would not have permitted its retention in any ordinary museum. We are greatly indebted to Mr. Sharrock for some photographs of the "ship" *in situ*, from which the two illustrations in the accompanying Plate were taken. It appears that this is not the first instance of such an occurrence in the alluvial deposits of the Lea. About 1830 a large boat was unearthed in excavating for the East London Water Company's Reservoirs near Temple Mills, and another is mentioned by Camden as having been found near the same place. See extracts from Robinson's *History of Hackney* in the "Notes" in the present part.

Mr. Traill pointed out the site of the discovery of the "Dug-out Canoe" at the depth of about 6 feet from the surface. The details will be found in Mr. Holmes' paper above referred to, and some particulars of a "Dug-out,"

found in the old bed of the Thames, will be printed in the present part. The Dug-out itself was inspected in the shed in which it had been placed previous to its removal to the British Museum.

Mr. Sharrock showed a large photograph of the canoe, in its original position, from which the plate in the last number of the ESSEX NATURALIST was copied. An enlarged and framed copy of this photograph has been presented by Mr. Sharrock to accompany the objects from the excavations to be placed in the Epping Forest Museum.

At the close of the inspection the large party was most hospitably entertained at tea by Mr. and Mrs. Sharrock

Afterwards a short meeting was held (being the 204th ORDINARY MEETING), Prof R. Meldola, President, in the chair.

The following were elected members of the Club:—Mr Harry H. Brothers, Mr. Phillip W. P. Carlyon-Britton, J.P., D.L., F.S.A., &c., Mr. W. S. Page, Mr. G. H. Menhenick, and Her Grace the Duchess of Sutherland.

The President proposed that they should pass a very hearty vote of thanks to Mr. and Mrs. Sharrock for their kindness and hospitality, and for the excellent arrangements made for the comfort of the party that afternoon. This was passed by acclamation.

Mr. Sharrock replied, and then, at the request of the President, gave some interesting details of the engineering features of the works, illustrating his remarks by maps and plans,

The company was photographed and were shown the various relics, bones of animals, pottery, and Saxon and other implements, which had been found during the excavations, and carefully preserved by Mr. Sharrock, Mr. Traill and Mr. Marsh. Most of these are now (March, 1902) in the Epping Forest Museum, and descriptions will be published later.

At the close the party was taken back by the extemporised railroad to the point of entrance near Tottenham, and so ended a very pleasant and instructive visit.

WEDNESDAY, JULY 24TH, 1901.

The Countess of Warwick very kindly invited the members of the Club to the Annual Prize Distribution at her "Secondary and Technical Science School" at Bigods, near Dunmow, which took place on this day, and a large number of members availed themselves of the opportunity of inspecting this very interesting experiment in practical elementary teaching where science is made an integral part of each child's education. Bigods is well known to many of us, Lady Warwick's hospitality having more than once been extended to the Club.

A very large party of friends of education from Essex and the Metropolis assembled at luncheon in the large marquee in the grounds at Bigods, and afterwards at the meeting held, Lady Warwick presiding. Following the presentation of the report by Mr E. E. Hennesey, B.Sc. and the presentation of the prizes by Lady Rosslyn, Sir Philip Magnus delivered a very interesting address. Other speakers were the Earl of Warwick, Mr. E. N. Buxton, Mr.

Elliott (Board of Agriculture), Prof. James Long, Dr. Wormall, and Sir Edward Verney.

At the close of the meeting the guests had an opportunity of inspecting the School buildings and appliances, and tea in the gardens concluded a very pleasant and instructive visit. Lady Warwick's experiment has proved to be most successful, and is one that should be attentively studied by all interested in the pressing problem of rural and secondary education.

THE ANNUAL CRYPTOGAMIC MEETING AND 205TH ORDINARY MEETING.

SATURDAY, OCTOBER 12TH, 1901.

This meeting was held at High Beach and surrounding parts of the Forest. The arrangements were precisely those of last year; the "Head-quarters" being at the "King's Oak" Hotel, where the large exhibition and meeting-room had been engaged.

The Referees were:—Dr. M. C. Cooke, E. M. Holmes, Esq., F.L.S., George Massee, Esq., F.L S. (*Kew Herbarium*), and Prof. H. Marshall Ward, D.Sc., F.R.S. (*Professor of Botany, University of Cambridge, and President of the Mycological Society*).

The botanists reached the assembling place at various times throughout the day, and parties explored the woods at Woodford, Buckhurst Hill, Loughton, High Beach, and the Theydon Woods. A very large and varied collection of specimens was made, which were exhibited in the room and determined by the experts present. Dr. Cooke's and Mr. Massee's reports will be found in another part of this issue (pp. 127-30).

Amongst the other interesting things shown were a series of beautiful coloured drawings of some species of Micro-Fungi occurring in the Forest, drawn and exhibited by Mr. Massee. Mr. Cole exhibited a selection from the Cryptogamic Herbarium formed by the late George Varenne, of Kelvedon, recently acquired by the Club. Mr. H. Whitehead exhibited some specimens of Micro-Fungi (leaf-fungi) recently collected in Essex.

Tea was taken about 5.30 o'clock, and afterwards an ORDINARY MEETING (the 205th) was held, the President, Prof. R. Meldola, F.R.S., in the chair

The following were elected members of the Club:—Miss A. E. Baxter, Miss Camilla Jebb, Mr. F. T. Norris (*Saga-Master, Viking Club*), Mr. W. B. Parsons, M.R.C.S., and the Right Hon. the Earl of Warwick, Lord-Lieutenant of Essex.

Dr. Cooke and Mr. Massee reported on the results of the day's work. These reports will be found in the present part of the ESSEX NATURALIST (*ante* pp. 127-130). Dr. Cooke was of opinion that the "bag" was the best for the last 10 years

Dr. Cooke also delivered an address; the first part of it, consisting of corrigenda to his *Illustrations*, with indications of new species to the Forest, or corrections in the nomenclature of old ones, is printed in the present part (*ante* pp. 131-34). The second part of his speech consisted of humorous descriptions of the utility and social aspect of these annual forays.

Prof. Marshall Ward, F.R.S., then gave an address on the Scientific Study of Fungi. The Professor urged the importance of studying the "life-histories" of these plants, and said that he would be pleased to see any member desiring to take up the study at Cambridge, and to show the methods of investigation there adopted.

The Curator had prepared a report on the Vârenne Cryptogamic Herbarium, which was taken as read, and which will be found in the "Museum Notes" in the present part.

Cordial votes of thanks were passed to Prof. Ward, to Dr. Cooke, and to Mr. Massee, and also to the other botanists who had assisted in various ways in aid of the meeting.

The meeting was a very large one; about 100 members and friends attending it.

THE 206TH ORDINARY MEETING.

SATURDAY, OCTOBER 26TH, 1901.

The first meeting of the Winter Session, being the 206th ORDINARY MEETING, was held in the Physical Lecture Theatre of the Municipal Technical Institute, West Ham, at 6.30 p.m., the President, Prof. R. Meldola, F.R.S., in the chair.

Mr. Edmond J. Boake, B.A., and Mrs. W. D. Cansdale, were elected members.

Mr. Cole exhibited some sets of specimens which he had arranged for the Museum in illustration of the subject of "Protective Resemblance" amongst insects.

He also exhibited specimens of *Sphinx convolvuli*, which had been taken at the electric lamps in the Romford Road, near the Museum. Several others had been brought into the Museum in a mutilated condition, and he had heard of the capture of many specimens in Essex. Indeed the insect had occurred in numbers in many parts of England, and 1901 would merit remembrance by entomologists as one of the great "*convolvuli* years"

Mr. A. Harrison sent for exhibition six fine specimens of *Sphinx convolvuli* taken on September 24th and 25th, also in the Romford Road, Stratford.

Mr. Cole also exhibited a specimen of *Limenitis sibylla*, the "White Admiral Butterfly," which had been caught in August in Mr. Cole's garden at East Mersea, by Master Harold Elliott, who reported that he had seen another also. Mr. Cole said that the butterfly still occurred in the woods near Colchester, and there was a series in Dr. Laver's collection, but as far as he knew Master Elliott's specimen was the first recorded for Mersea. Master Elliott had kindly presented the butterfly to the cabinet of the Club.

Mr. John Spiller exhibited a fine crystal of Selenite from Aylesbury.

Mr. Cole said that small crystals of Selenite were to be seen very abundantly in the London Clay exposed during the excavations now being carried on in constructing the new railroad across the Roding Valley from Woodford to Chigwell, but he had not seen any equal in size to Mr. Spiller's specimen.

He remembered that when the sewers were being dug at Chingford and Walthamstow some years back, many fine crystals were obtained by the workmen. They used to call them "frozen" or "congealed" water.

Mr. Scourfield, Mr. Elliott, and Dr. Auden confirmed these statements.

Mr. F. H. Varley, F.R.A.S., having, as a member of the Council, taken the chair.

Prof. Meldola delivered a most interesting lecture upon "Mimetic Insects." The subjects treated were, the production of colour in the living organism—Adaptation in colour and pattern to the environment—Protective and aggressive resemblance—Wallace's theory of "warning colours"—The parallelism between protective resemblance and mimetic resemblance—The Batesian theory of mimicry and its limitations—Extension of the theory by Fritz Müller—Later researches on the subject of "Common warning colours."

The lecture was beautifully illustrated by natural-colour photographs taken by the Sanger-Shepherd process, the specimens being chiefly from the collections in the Hope Museum, and arranged for the present lecture by Professor E. B. Poulton, F.R.S., Hope Professor of Invertebrate Zoology, University of Oxford. These unique photographs were shown by means of the electric lantern.

The lecture was listened to with marked attention by the large audience, and was frequently applauded.

The Chairman in moving a cordial vote of thanks to the lecturer, congratulated him on having delivered an admirable exposition of one of the most striking theories of modern biology, and also on his re-appearance in the Presidential Chair after an interval of 18 years. Mr. Varley also alluded to the excellent examples of the new art of producing natural-colour photographs which had been made by Mr. Sanger-Shepherd, which proved the value of the process as a means of illustrating lectures such as that to which they had all listened with so much profit and pleasure.

The vote of thanks was seconded by Mr. T. Spiller, F.C.S., and carried amid applause.

Prof. Meldola, in responding, expressed his indebtedness to Prof. Poulton for the beautiful examples selected from the Hope Museum. That Museum under Prof. Poulton's enthusiastic curatorship, had gradually acquired what was probably the finest collection illustrating "mimicry" and "protective resemblance" in Europe. He was also much obliged to Mr. Sanger-Shepherd for the care and skill shown in making the lantern slides.

THE 207TH ORDINARY MEETING.

SATURDAY, DECEMBER 14TH, 1901.

The 207th ORDINARY MEETING was held in the Physical Lecture Theatre of the West Ham Technical Institute, at 6 30 p.m., the President, Prof. R. Meldola, F.R.S., in the chair.

Mr. Frank P. Smith was elected a member of the Club.

Mr. W. Cole exhibited some examples of a series of species of butterflies which were intended to be placed in the Museum to illustrate the theory of Mimicry amongst insects.

He also exhibited some specimens of the curious mollusc, *Petricola pholadiformis*, which had been presented by Mr. J. E. Cooper and Mr. A. S. Kennard. Mr. Cole and Mr. Kennard made some remarks upon the species, which are embodied in a "Museum Note" in the present part of the ESSEX NATURALIST.

Dr. Thresh read a paper by Miss May Thresh on "Manganiferous Nodules in the Boulder-clay of Essex." This paper is printed in the present part, *ante* p. 137.

Mr. T. S. Dymond, F.I.C., made some extended remarks upon this paper which are printed *ante* p. 139, and a short discussion upon it was carried on by Mr. Dalton, F.G.S., Mr. D. Howard, F.C.S, and Mr. J. W. Salter.

The Secretary said that he had received some little time back a paper by Mr. J. P. Johnson on a Manganiferous Deposit in the Thames Valley Drift at Ilford, which was already in print, and which would appear at the same time as Miss Thresh's paper (*ante* pp. 135-6).

On the proposal of the President, who remarked that the paper was a most interesting piece of work, a cordial vote of thanks was passed to Miss Thresh.

Mr. Martin Hinton read a paper prepared by himself and Mr. A. S. Kennard entitled "Contributions to the Pleistocene Geology of the Thames Valley. I. The Grays Thurrock area, Part II.," being the continuation of the paper already published in the ESSEX NATURALIST, Vol xi., pp. 336-370.

A discussion on the paper took place, carried on by Mr. T. V. Holmes, F.G.S., Mr. Dalton, F.G.S., Mr. Rudler, F.G.S., Mr. J. W. Salter, F.G.S., and the President. Mr Hinton replied, and the authors were unanimously thanked for their communication.

In the absence of the author, Mr. C. D. Soar, F.R.M.S., Mr. Scourfield read a paper on "The Water-Mites (*Hydrachnidæ*) of Epping Forest."

The paper was illustrated by many beautiful coloured drawings, done from nature by Mr. Soar, and Mr. Scourfield exhibited some specimens of Water-Mites under the microscope.

Both Mr. Soar and Mr. Scourfield were thanked for the paper, and the meeting ended.

CONFERENCE OF THE EAST ANGLIAN NATURALISTS' SOCIETIES, VISIT TO DUNMOW AND TO LADY WARWICK'S SECONDARY AND SCIENCE SCHOOL AT BIGODS.

THURSDAY, JUNE 6TH, 1901.

This meeting was designed to admit of a visit to a very pleasant district; to hold a second preliminary Conference with the representatives of the East Anglian Natural History Societies, with a view to combined action in the future; and to visit "Bigods" at the kind invitation of the Right Hon. the Countess of Warwick.

The London-side party travelled by the 9.10 express from Liverpool Street, slip carriages being detached at Bishop's Stortford, where the assembly of all attending the meeting (a large party) was called at the Chequers Hotel at about half-past ten. Here carriages were awaiting the party, and no time was lost in getting on the road to Easton Park and Dunmow. An excellent report of the meeting was given in the London *Standard* on June 7th, and we cannot do better than quote a few paragraphs, making some corrections and additions where the reporter fell into error or was unacquainted with the facts :—

"For some time there has been a feeling that it would be well if something could be done to bring about combined action on the part of the Natural History Societies in the three counties which constitute East Anglia in the widest sense of the term. In 1898 a Conference between the members of these Societies was held at Witham, and since then a good deal has been written on the subject. Yesterday, a second Conference took place at Dunmow, which was arranged by Mr. W. Cole, F.L.S., the Secretary of the Essex Field Club [also by Prof. Meldola, the President], and it was preceded by an excursion through one of the prettiest parts of the district under consideration. Essex and Norfolk have well-established Societies, each publishing a record of work, with distinctive features. The Suffolk Natural History Society in Bury has no publication, and this is also the case with the Ipswich Scientific Society. The two first-named bodies have a pretty large membership, and for their benefit a very pleasant excursion was arranged. An early start was made from Liverpool Street Station, whence the ride through the Stort Valley is distinctly pretty. It has no pretensions to grandeur, but for beauty of a calm, pastoral kind, it is hard to beat. If it has not the massed timber of the Midlands, there is a sufficiency of trees to give charm to the landscape, and the small clumps and lines show up the foliage against a summer sky with an effect as good as, if not better than, that produced by thicker planting. One might travel miles before one could see such masses

of colour—pink chestnuts and hawthorns, the laburnum with its golden tassels, white lilac, and the dark metallic foliage of the copper-beech; and over all there is an air of peacefulness, so that one of the party was probably not far wrong when he compared the valley of the Stort of to-day to the valley of the Lea in the days of Izaak Walton."

"From Stortford the members drove along the old Roman stone street, with a stop at the church of Little Easton, notable for its half-effaced wall-paintings in the nave—the Crucifixion, the Burial, and some others on the South side, and a St. Christopher on the North. There is a peculiarity about ancient wall paintings—they grow upon one, and become more distinct the longer one gazes, till the half-effaced figures seem so familiar that one wonders

Oak Tree in Easton Park, Essex.
From a Photograph by Prof. Meldola.

there was ever any hesitation as to deciding what they represent. This church contains one of the few brasses which remain of a Knight wearing the Garter badge, and in the Maynard Chapel are some fairly good monuments—one of them occupying the site of the old altar, as is evidenced by the piscina on the South side. Opposite the church are the old stocks, with an upright post fitted with iron holdfasts to confine the hands also."

At the church the party was received by the Rector, the Rev. A. L. Whitfield.

Our member, Mr. G. E. Pritchett, F.S.A., very kindly gave a demonstration of the numerous monuments, very many being those of members of the

Maynard family, the ancestors of Lady Warwick. A full description, with plates of the more notable monuments, will be found in Mr. Chancellor's great work *The Ancient Sepulchral Monuments of Essex*. At Easton the party was met by Mr. John F. Rogers, Agent to the Easton Estate, and the drive through this beautiful park was much enjoyed. Herds of fallow deer were seen, and some remarkable trees were pointed out. Two in particular, an oak and a hornbeam, were measured by Mr. Rogers, and the dimensions are worth recording:—

Oak Tree in Easton Park.

Height from ground to the crown of the butt ..	24 feet.
Girth at bottom of tree	42 ,,
,, 3 ft. from ground	33 ,,
,, 8 ft. ,, ...	30 ,,

Hornbeam Tree in Easton Park,

Height from ground to crown of butt ..	10 feet.
Girth at bottom of tree	34 ,,
,, 5 ft. from bottom . ..	27 ,,
,, 10 ft. ,, ...	34 ,,

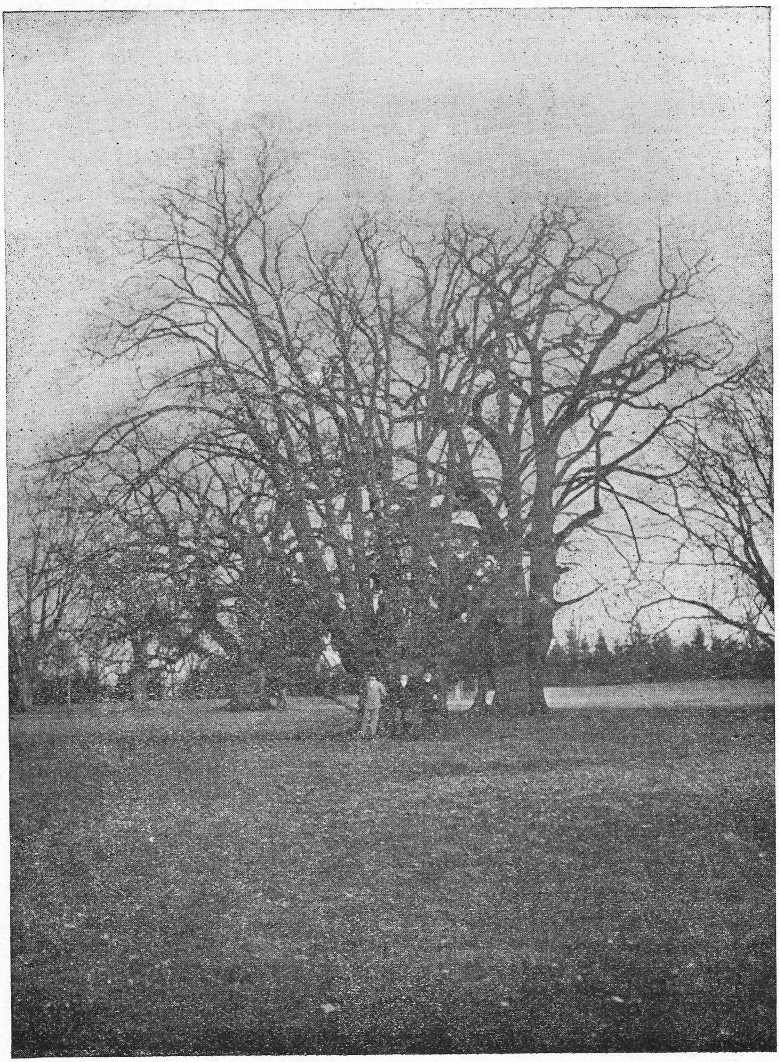
Prof. Meldola had been staying at Easton Park Cottage and had photographed both these trees, and we are thus enabled to give illustrations of them. It is much to be desired that members photographically inclined would follow the President's example, and thus insure the preservation of pictures of interesting trees which may be noticed in various parts of the County.

The drive was continued to the ancient village of Dunmow, where luncheon awaited the party at the "Saracen's Head" hotel.

The Conference was quite arcadian, taking place in the pretty little garden of the hotel. Prof. Meldola took the chair. Unfortunately, but few members of "East Anglian" Societies other than the Essex Field Club were present. Mr. Southwell, F.Z.S., and Mr. H. Scherren, F.Z.S., well represented the Norfolk and Norwich Society, but no official member of the Ipswich Scientific Society attended.

Mr. W. Cole re-called what had passed at the first Conference held at Witham on July 23rd, 1898,[1] and advocated the initiation of some scheme of "Systematic Biological and Pre-historic Archæological work in East Anglia." He alluded to the close connection of the three counties of Norfolk, Suffolk and Essex, from the point of view of their Natural History and Geology, and the similarity of the coast-line. The Essex and the Norfolk Societies had done a great deal of faunistic work, of value to the student of geographical distribution, but there was still ample opportunity for further investigations, pursued year by year. This was especially the case with respect to the marine zoology of those regions of the North Sea bordering the counties, where of late years there had been considerable changes in the fauna. These should be carefully recorded, as also should be the variations in the coast-line. He was not alluding to the higher and more difficult work of biological investigation into the life-histories of the marine organisms of the North Sea.

1 A full report was printed in the *Essex Naturalist*, vol. x., pp. 360—368.



Hornbeam Tree in Easton Park.
From a Photograph by Prof. Meldola.

This would necessitate a marine station, and much more elaborate provision both of skilled workers and appliances. A little might be accomplished on this higher plane, but the work immediately in front of them was faunistic, and this was certainly well within the powers of the East Anglian Societies. There was sometimes a great waste of energy in working independently, and without reference to what other societies had done or might do. He should like to see some arrangements by which each society should work in conjunction with the others, so that any subject taken up might be thoroughly investigated, without the disadvantage of members going over ground that had been already explored, or taking up questions that had been threshed out. Each of the counties concerned had now excellent museums—but to insure that the collections should worthily illustrate the rich East Anglian district, long-continued *systematic* collecting was necessary. This work, especially the marine dredging, &c., might often be costly and difficult. Combined effort by the three counties might furnish funds and expert assistance which would be beyond the means of any one of the societies working separately.

Mr. Cole also advocated the establishment of a quarterly journal of natural history, geology and pre-historic archæology for East Anglia, to be published by the societies of the three counties. At present they had the *Essex Naturalist* and the *Transactions of the Norfolk and Norwich Natural History Society*, but he had not heard of any publication efforts in Suffolk. The quarterly "East Anglian Naturalist" might be edited by three gentlemen nominated by the societies. The main difficulty in the way of such a project was the varying rates of subscriptions of the three societies, but this might be surmounted. He was aware that in advocating the issue of one journal for the district he was not in accord with the views of some local naturalists, and it must be admitted that the "county" as a unit for local work was yearly becoming more important, in consequence of recent political and social changes.

Possibly some of them had read recently in leading newspapers letters advocating greater attention being paid to what had happily been termed "the buried history of Britain." In his opinion this most interesting and instructive work of archæological investigation could best be carried on by the local societies. They had the machinery, but the *funds* were wanting. Mr. Cole suggested that it might be possible for the British Association to bring the matter before the Government, who could put it in the power of the County Councils to allocate a very moderate annual sum towards the expenses of such systematic exploration work in biology, geology and archæology, the prosecution and accomplishments of which would in any case afford object lessons of very considerable patriotic and educational value, and sometimes even confer direct practical benefits upon the districts concerned.

Prof. Meldola spoke of the advantages to be derived from co-operation and combining forces, but admitted the difficulties that stood in the way. The British Association had not been successful in its attempts to promote federation among local societies, for the members of some maintained that better work was done independently than could be done when a number of societies were working together. There were two schools of thought—one in favour of independence, the other in favour of co-operation; and on the whole

he was disposed to believe that the balance of evidence was in favour of the latter.

Mr. Southwell, F.Z.S., said that he, and, he believed he might add, all the members of the Norfolk and Norwich Naturalists' Society would welcome any scheme by which co-operation between the scientific workers of East Anglia could be brought about, and mentioned at least one line of work which seemed to have been neglected in the Norfolk district. He was strongly in favour of adding Ethnology to the subjects to be covered by the Norfolk Society or by the united Societies, and mentioned that near Cromer there were people possessing racial peculiarities which would well repay special study. The establishment of a fresh-water biological station had been advocated by one of their members, who thought that a floating station could be equipped for a small sum, and made self-supporting, and he agreed with Mr. Cole that everything possible should be done in the way of investigating the continually changing fauna of the coast, especially in he estuaries.

Mr. Scherren, F.Z.S., also spoke in favour of the proposal for combined work in the directions indicated.

Mr. Adair Roberts thought that perhaps they might nominate members of the different societies to prepare some scheme of work, but Prof. Meldola said that that had already been done. It was eventually agreed that it should be an instruction to the Council of the Essex Field Club to take such steps as may appear necessary to bring about some kind of co-operation between the Natural History Societies of East Anglia, with a view to promoting systematic action in biological work and in all matters concerning prehistoric archæology.

At the invitation of the Chairman, Mr. E. E. Hennesey, B.Sc., then gave some particulars of the scheme of education carried on at the Countess of Warwick's School at Bigods, which the party were to visit that afternoon.

Prof. Meldola proposed that votes of thanks should be passed to all who had assisted in the conduct of the meeting, specially mentioning Mr. Rogers, the Rev. A. L. Whitfield, and Mr. Pritchett. He said that Lady Warwick had hoped to be present and to have personally welcomed them at Bigods, but an engagement that could not be put off prevented her having the pleasure of meeting the members, whom, in her name, he invited to visit the school.

The carriages were then again put into requisition for a pleasant drive through the lanes to Bigods, where the company was received, in Lady Warwick's absence, by Mr. and Mrs. Hennesey. This was the second visit of the Club to the School, which was started at the time when the County Council had not taken into serious consideration the question of education in rural districts, and the course of work has been so planned as to be of special service to pupils who intend to adopt farming or kindred pursuits as their occupation in after life. Mr. Hennesey conducted the visitors round the workshops, laboratories, class-rooms, and poultry runs. All are of the most modern design, and Mr. Hennesey explained the working of the scheme. The apiary and garden plots were also visited, Mr. Thomas Hacking explaining the agricultural portion of the curriculum.

Much interest was taken in the demonstration, and there was a general expression of opinion that Lady Warwick's experiment went a long way to solve the difficulty of technical instruction in rural districts.

The visitors were afterwards entertained to tea, the appreciation of it being inhanced by the rumour that the excellent light refreshments had been made by the cookery students in the school itself.

NOTES ON "DUG-OUT" BOATS IN THE ANCIENT MARSHES OF THE LEA AND THE THAMES.

Referring to Mr. T. V. Holmes' paper, "Geological Notes on the New Reservoirs in the Valley of the Lea, near Walthamstow," in the last part of the ESSEX NATURALIST, it seems desirable to add to the account of the "dug-out" canoe therein given (*ante* pp. 11, 12), some details extracted from Mr. W. Traill's paper in *The Reliquary and Illustrated Archæologist* for January, 1901, and to supplement this by an account of a similar boat found in the mud of the old Thames a few years ago.

The Lea boat was found on October 30th, 1900, at a depth of about six feet from the surface, lying almost due north and south, with the bow towards the south, and seems to have been drawn up on the bank of an old river. It was resting on a bed (5 ins. thick) of fine, sandy silt mixed with fresh-water shells, at a level of 21 ft. above ordnance datum. The geological position in which the canoe lay has already be stated, and its appearance both *in situ* and when placed on the trolley for removal, is well shown in the illustrations accompanying Mr. Holmes' paper.

It had evidently been hollowed out of the trunk of an oak tree. Mr. Traill took the principal dimensions as follows:— Extreme length, 14ft. 10in.; extreme breadth, 2ft. 4in.; extreme depth, 1ft. 4ins.; extreme depth inside, 1ft. 1½ins.; thickness of timber at gunwale, ⅜in.

"Both ends are rounded, but the sides are almost at right angles to the flat bottom. Eight feet from the stern a strengthening rib has been left in, 6ins. wide and 7ins. deep, and 3ft. 8ins. nearer the bow a small rib has also been left in. On the right side of the stern a hole ⅞ of an inch in diameter has been drilled vertically through the gunwale. An oak peg has been fitted into this, and cut off to the slope of the outside and

either cut or broken off flush with the gunwale, which at this point is slightly hollowed, as though worn. There is an identically similar hole on the same side of the bow. Unfortunately, the corresponding parts of the left side of the boat are gone."

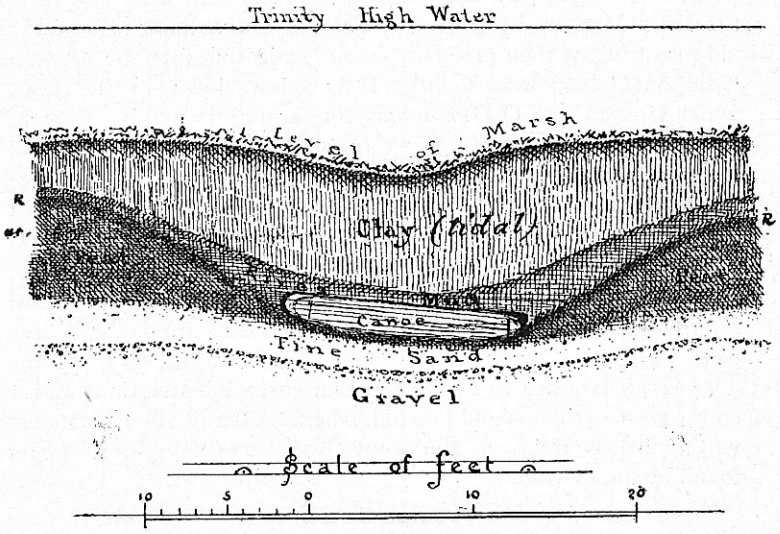
The only object found that could be identified as an implement was a piece of oak, sharpened to a point, which can be seen lying inside the boat in the plate given in the last part. "This was got below the boat, in a similar position to the one it occupies in the plate, and may possibly have been part of a punting pole. Unfortunately, the rest of it, along with the bow and part of the side, had been broken off by the workmen before they had realised the nature of their find."

The boat has now (March, 1902) been removed to the British Museum at Bloomsbury. Mr. Traill adds, "it may be interesting to note that several pieces of Roman pottery and a well-made iron spear-head have been found at points ranging from fifty to a hundred yards from where the dug-out was lying, and in practically the same stratum." These last mentioned specimens, together with others found in the excavations, are now deposited in the Epping Forest Museum of the Club, by the kindness of Mr. Sharrock, Mr. Traill and Mr. Marsh, the engineers superintending the works.

In 1878, when the marshland on the northern side of the Thames was being excavated across the Plaistow and East Ham level for the construction of the Royal Albert Docks (Victoria Docks extension), the workmen uncovered a "dug-out" canoe, which from the description appears to be similar to that found in the Lea deposits. Fortunately the geological sections in these excavations were examined and described by Mr. Whitaker, F.R.S. (*Geology of London, &c.*, I., pp. 461-2), and Mr. Flaxman C. J. Spurrell, F.G.S., F.S.A. had an opportunity of seeing the boat *in situ*. His observations were published in the *Archæological Journal* for 1890 (vol. xlvii., p. 170), and from that paper we compile the following account. Mr. Spurrell made a drawing of the section in his note-book at the time, and as this has not hitherto been published we are glad, by his kindness, to engrave it now.

The "dug-out" was in a fairly good state of preservation and made out of a single trunk of oak and carefully fashioned into a regular form, and planned to measure. The length from

bow to bow (for both ends were exactly alike) was 17 feet; the width outside abeam between 24 and 25 inches, and so continued with the exception of the last 12 inches of both ends; these sloped inward 8 inches, the ends being straight (not rounded) and about 8 inches wide. The sides and bottom were flat and rectangular. At the thinnest part above the sides were little more than half-an-inch thick, but about 3 inches below at the junction with the bottom. And the bottom thinned to less than 2 inches in the middle. There was a peculiar arrangement at each end, perhaps a kind of raised seat. There was no keel, no ribs or stretchers at bottom, and no rowlocks. Nothing was found with the boat.



Section showing the position of the Dug-out Canoe in the Thames Marshland. Drawn by F. C. J. Spurrell, 1878.

Mr. Spurrell speaks of the old peat surface at the spot where the boat was found as that on which Romans lived and died. "Roman black pottery (I saw some Samian) and food refuse, with tiles, were found between 8 and 9 feet below the surface (which was 5ft 6in. O.D.) on and in the top of a layer of peat; this was covered by tidal mud."[1] The section reproduced here, he describes as "showing that in the peat layer a stream

1 "Early Sites and Embankments on the Margins of the Thames Estuary," *Archæol. Journal*, vol. xlii. (1885).

(fresh-water) had excavated a small channel; that this stream was accustomed to carry boats was evident, because in its own mud and not in the peat itself, the boat was found. The surface of the peat was the shore of that day, and the existence of the stream must have been prolonged to the later part of that period which was occupied in the accumulation of the tree's growth and their *débris*. Therefore, the stream was apparently in full run about 1700 years ago, and the boat apparently belongs to that age. Since the boat was lost, the deposit of tidal mud had almost obliterated any sign of the channel"

Mr. Spurrell records in his paper on "Early Sites and Embankments on the Margins of the Thames Estuary" (*Archæological Journal*, vol. xlii., p. 302, *note*) that near a spot in the Erith Marshes by Belvedere Station where moor-logs of the old forest might then (1885) be seen projecting into the ditch, a "dug-out" boat was found. It was low down in the peat, which rises to zero O.D. and was cut through in making a ditch, the ends of the boat being left in either bank. "From out of this boat a polished flint axe and a very beautiful flint scraper were obtained. Another polished axe of large size was dredged out of the same peat bed in the river off Prices' works close by."

The Albert Docks boat was secured for the British Museum (by Mr. Whitaker's intervention) where, Mr. C. H. Read informs us, it is still preserved. As the Museum now has the two "dug-outs" (one from the Lea and the other from the Thames) it is much to be desired that careful descriptions and a comparison of them should be published. Meanwhile our readers will doubtless welcome the above records of "dug-out" boats found in the district.

NOTE ON A SMALL SHARK (*? Galeus vulgaris*) SEEN IN BRIGHTLINGSEA HARBOUR.

By H. C. SORBY, LL.D., F.R.S., F.L.S., &c.

When walking on the deck of my yacht, lying in Brightlingsea Harbour on August 23rd, 1901, at about 4.15 p.m., I heard a loud splashing, and, on looking to see what was the cause, I saw a small shark, about ten yards off, with its tail curled round and flapping it on the surface of the water. It then straightened itself out and swam towards the yacht, but, at

the same time, sank down out of sight. I clearly saw that it had a heterocercal tail, the upper part being rounded and not very long, and that its body was of grey colour, and apparently about five feet long. Taking all into account, it seems most probable that it was *Galeus vulgaris* or the "Toper"; but, under such circumstances, it was impossible to see and examine detailed characters, so as to be quite sure of the species According to Dr. Laver's book on the Vertebrata of Essex (p. 119), this small shark has previously been met with on two occasions on the coast of Essex, but yet is sufficiently rare to make it desirable to record the occurrence for another individual seen in the estuary of the Colne.

MUSEUM NOTES. No. III.

VI.—THE CRYPTOGAMIC HERBARIUM OF THE LATE MR. E. G. VARENNE.

In 1891 we published in the ESSEX NATURALIST a valuable paper on the "Cryptogamic Flora of Kelvedon and its neighbourhood," which had been compiled by Mr. E. D. Marquand from the herbarium and notes made by our late member, Mr. E. G. Varenne, M.R.C.S., of Kelvedon.

At Mr. Varenne's death in 1887 these materials had, at his request, been handed over to Mr. Marquand by Mrs. Varenne. In March of the present year (1901) we had great pleasure in acquiring the Cryptogamic Herbarium and some of Mr. Varenne's botanical books for the Essex Field Club, by purchase from Mr. Marquand, who thought they would fittingly find a resting-place in the County Museum. Very many of the specimens had been collected in Essex, and these supplied the *data* for the paper above referred to. Unfortunately Varenne's Phanerogamic Herbarium perished in the way thus stated by Mr. Marquand:—

"The whole of my Natural History collections had to be warehoused when I went abroad (that was after my paper in the ESSEX NATURALIST was written) and on my taking them out again some four years afterwards, I discovered to my great sorrow that very nearly the whole of my phanerogamic herbarium was *ruined* by the attacks of insects! so that it had to be burnt. The great bulk both of my own large herbarium and of Varenne's collection was thus destroyed. What could be saved out of the wreck I packed up and gave away to a botanical friend who is now in Australia. Varenne's cryptogamic collections were uninjured (with the exception of some of the Lichens) and so you have them.

"Varenne did not keep his Essex plants distinct; they were inserted in their proper places amongst others in his herbarium, nor did he trouble to preserve an Essex specimen if he had a sufficiently characteristic one from elsewhere. The great value of his collection of flowering plants consisted—not in its completeness as a county collection, nor even in the number of his own personal gatherings—but in the authentically named critical species which he had received from British specialists. Although an excellent 'all-round' botanist, Varenne had a special liking for the cryptogams rather than phanerogams, and nearly all the specimens in his collection of the former were gathered by him."

The Varenne Cryptogamic Herbarium, thus rescued from further destruction, consists of the following, in round numbers :—

350 Mosses	450 Lichens
150 Hepaticæ	100 Sea-weeds
200 Fungi (Leaf-parasites)	250 Fresh-water Algæ
	1,500

And two quarto volumes of Essex Mosses, neatly mounted and in good preservation.

The books are, Gibson's *Flora of Essex*; Hassell's *British Fresh-water Algæ* (2 vols); Mudd's *Manual of British Lichens*; Wilson's *Bryologia Britannica*, and Leighton's *British Lichen Flora*. All these books were Varenne's working copies, and they contain many marginal notes of Essex and other localities in his handwriting.

Essex botanists will regret to hear of the destruction of the Varenne flowering-plants. It is an instance of what so commonly happens in such cases. The proper home of local collections is the nearest local Museum. How many specimens and collections are there, now mouldering away in country houses in Essex? The owners are tired of them, but they cannot summon up courage to place the specimens where they would be cared for and valued, and where they would be of use to those studying the natural history of the County.

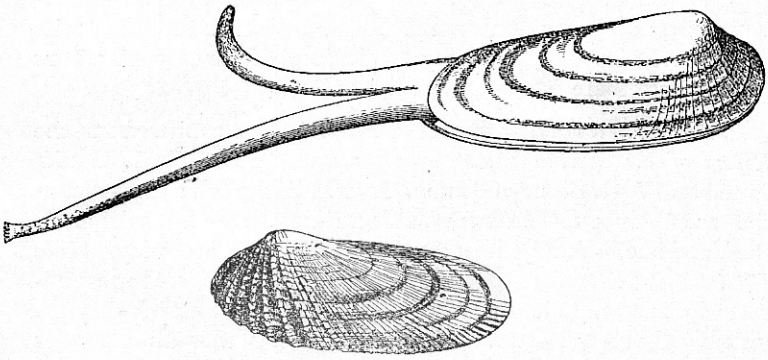
VII.—PETRICOLA PHOLADIFORMIS IN ESSEX AND KENT.

For some years past conchologists have been aware of the existence in England of a shell whose true home is on the east-central coast of North America. It was first noticed, probably,

by Mr. Walter Crouch, F.Z.S., about 1890, when he obtained a dead shell from the Crouch river near Burnham, and living specimens have since been found there. We have in the Museum two valves sent, with other things, by a dredgerman from the same locality. And Mr. J. E. Cooper and Mr. A. S. Kennard have since presented to the Museum a set of Kentish specimens, together with some notes, from which a portion of the following account is compiled.

The original record of the mollusc in England was by Mr. Cooper in the *Proc. Malacological Society*, June 14th, 1895 :—

"In April, 1895, I found at Burnham-on-Crouch, Essex, a shell which Mr. E. A. Smith identified as *Petricola pholadiformis*, Lam. It was picked out of a large heap of oyster and whelk shells which had been dredged in the river. One valve was considerably broken, but this was probably owing to



Petricola pholadiformis, Lam. From the *Report of the Invertebrata of Massachusetts*, by Dr. A. A. Gould.

rough usage; the fresh condition of the specimen points to its having lived in the river, where it was probably introduced with oysters. Mr. W. Crouch has also found an example of this species at Burnham."

And in the same journal, under date the 8th of May, it is recorded that :—

"Mr. W. Crouch exhibited specimens of *Petricola pholadiformis* from the River Crouch, Essex, and remarked that two living specimens had to his knowledge been taken in that river, both at Cricksea, a mile west of Burnham, in association with *Pholas crispata*."

And at the same meeting Mr. J. E. Cooper and Mr. A. S. Kennard, exhibited the first Kentish specimens, obtained in the spring at Herne Bay and near Sandwich. Mr. Cooper published

a short note (with a figure) in *Science Gossip* for 1896 (Vol. III., N.S. p. 147).

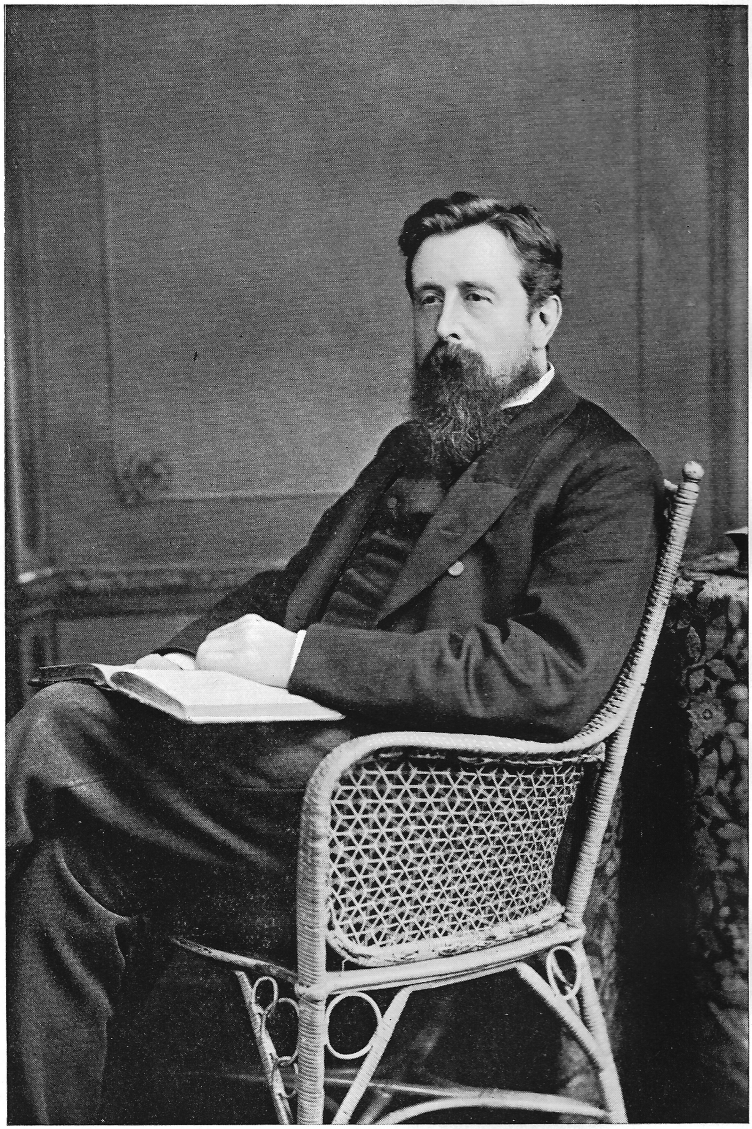
Mr. Kennard says that at Herne Bay it is by far the most abundant mollusc, "living in burrows, about six inches deep, in the London Clay. Associated with it is the well-known form, *Pholas candida* which it (superficially) closely resembles, but the *Pholas* is by far the rarer. It is probable that the *Petricola* will be the cause of the greater denudation of the foreshore, since its burrows break up the London Clay, and thus enable the waves to act in a more destructive manner than hitherto. There can be no doubt that the mollusc has been established at Herne Bay for many years, and that it has been overlooked through its outward resemblance to *Pholas candida*. It may readily be distinguished by the fact that the latter form possesses only one siphon, whilst *Petricola pholadiformis* has two, and it was this which first drew my attention to it. I believe that the species will eventually become a common denizen of those parts of our coast where there is a suitable habitat."[1]

The accompanying figures of *Petricola* are copied from the *Report of the Invertebrata of Massachusetts*, by Dr. A. A. Gould, edited by W. G. Binney (Boston, 1870). Although at first glance the resemblance to *Pholas candida* is striking, it really belongs to the Veneridæ, a family most members of which are very unlike *Petricola* superficially. The animals differ; in *Pholas* the respiratory siphons are united nearly to their ends; in *Petricola* they are united only at the base. *Pholas candida* has a small plate (or additional valve) over the hinge line and the ligament is not visible externally. In *Petricola* the valves fit close at the hinge, and there is a strong external ligament.

The habits of *Petricola* in America are similar to those described above by Mr. Kennard. Dr. Gould says "On various parts of our coast; at Chelsea and Nahaut beaches it is found abundantly, imbedded in jutting fragments of a marsh which once existed there, but which has been washed away by inroads of the sea, and now only an occasional remnant lifts its head above the surrounding sand. Also found in great quantities boring into hard blue clay, at low-water mark on Phillip's Beach."

It is an interesting biological question, how came it about

1 A. S. Kennard *in litt.*



The late EDMUND DURRANT,

Hon. Librarian to the Essex Field Club.

Born February 19th, 1843
Died August 30th, 1900.

that *Petricola* has departed so much in external form from the other members of the family (Veneridæ) to which it belongs? Must we adopt Lamarckism for the nonce, and hold that it is community of habits and environment which has produced the close resemblance in these soft-rock burrowing genera, *Petricola* and *Pholas*?

OBITUARY NOTICES.

THE LATE EDMUND DURRANT.

Honorary Librarian to Essex Field Club.

[*With Portrait, Plate IV.*]

It was with very great regret that many old members of the Club heard of the death of Edmund Durrant, a man highly respected from his prominence in many intellectual movements in the County, and, perhaps, the last in Essex of the grand old race of "literary booksellers," who knew something more of the books they dealt in than their bindings and prices. He died on August 30th, 1900, after a painful illness of several months' duration.

The materials existing for a memoir of Mr. Durrant are but scanty, and they have been utilised in the biographical notices in the local papers and in an article in the *Essex Review*; from these articles the following notes are mainly compiled.

Edmund Durrant came of a family which had settled in Chelmsford for many generations. His father was George Hill Durrant, actuary to the old Savings Bank; his mother before her marriage was a Miss Francis, daughter of an Essex farmer. After a school-boy life at the Grammar School, he went to Brighton as an apprentice, and then came to complete his business training at Hatchetts and elsewhere, and for some time was in business for himself at Walworth. About 1875 he came back to Chelmsford to settle for life at 90, High Street, in the bookselling and publishing house which had been established there for more than a century. Durrant quickly gave a literary tone to the business by the publication of works of local interest, and his shop was a delightful meeting-place, as all new books were placed on counters for folk to look at and talk about, quite in the style of the 18th century booksellers of the days of Johnson and Goldsmith.

Mr. Durrant founded, in January 1888, "Ye Chelmsford Sette of Odde Volumes," a literary and social club which met fortnightly at his house for lectures and discussion. It consisted of forty-nine members and a few "large-paper" copies. As "Volume One" Durrant was virtually President of the society, and he took great delight in the "Sette," obtaining for it the aid of many clever lecturers and speakers from town and country to meet on the "accustomed shelf" under his genial and hospitable guidance.

The Essex Beekeepers' Association was also another organisation of which he was the chief promoter. For many years he was its secretary, and

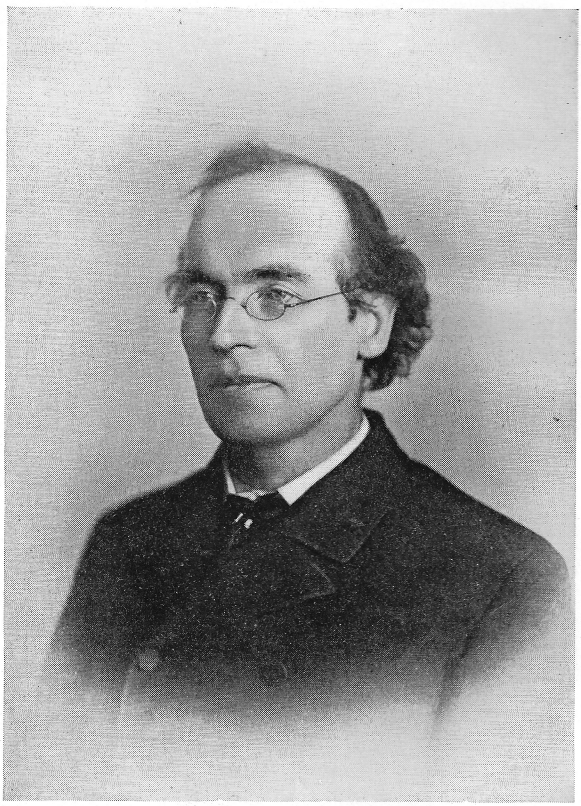
he often lectured on Bees and Beekeeping. He was also engaged by the Technical Instruction Committees of Essex, Suffolk and Yorkshire for the same work. He took an active part in the management of the Chelmsford Museum as secretary, and established there a series of lectures in connection with the University Extension movement. When the Essex Field Club made the attempt to re-establish the Museum on a scientific basis he acted as Librarian, and did all in his power to promote the welfare of the institution. But the deadly apathy of the town in such matters doomed the scheme to failure from the very beginning, and the Field Club was compelled to move its head-quarters to a more promising sphere of work. Mr. Durrant always took great interest in the Club and in the Essex Archæological Society, and he was a frequent attendant at their meetings when held in his part of the county.

In 1892 he established the *Essex Review*, which has been so ably edited from its commencement by our Vice President, Mr. E. A. Fitch, but which owed much of its early success to the energy and enthusiasm which Durrant threw into the work. He frequently contributed to it, and was always active in securing local matter for the enrichment of its pages. The whole pecuniary liability of this venture also rested with him. It is pleasant to know that both his pet hobbies will be continued on the lines he laid down. The "Odde Volumes" still flourish, and the *Review* will be continued under its present directors as a limited liability company.

Mr. Durrant was a consistent churchman, a synodsman of the parish church, an active member of the Ruridecanal Conference, and for the last few years one of the lay representatives of the Chelmsford Deanery at the Diocesan Conference. He was one of the managers of the Victoria Schools, and helped to found the present Church of England Institute at Chelmsford. In short, all good movements found in him a fervent partisan, but curiously enough he took no active part in municipal matters—it was the intellectual and educational phase of life which attracted him.

Durrant was a voracious reader, and in his little study, which his friends knew so well, he surrounded himself with many choice books and a very fine set of works relating to the history and productions of the County. It is rumoured that these have been left in trust for the benefit of his native town, when one of his aspirations, a public library, shall have been realised. His personal appearance was curiously clerical, with the slight stoop of the student, and utter absence of ostentation, and with every indication of a quiet, reserved, but withal amiable and courteous disposition. He lived in Chelmsford in philistine times, but it is to be hoped that one day some of his ideals may be reached; meanwhile the town has lost a familiar figure, a kindly friend, and a worker whose energies it will be difficult to replace.

For the loan of the characteristic portrait, from which our plate is taken, we are indebted to the courtesy of Mr. J. H. Nicholas.



HENRY WALKER, F.G.S.

Hon. Member, Essex Field Club.

THE LATE HENRY WALKER, F.G.S.

Honorary Member of the Essex Field Club.

[*With Portrait, Plate V.*]

In the honourable roll of those who have by their writings and example popularised the study of geology and natural history in the field, the name of Henry Walker will always be prominently inscribed. We of the Essex Field Club have special reasons for cherishing his memory—he aided our earliest efforts by the delivery of several excellent addresses, and his genial presence as a "Conductor" and Demonstrator at Field Meetings greatly enhanced the popularity and interest of these gatherings in the first few years of the Club's work. Perhaps one of his happiest efforts was almost the first publication of the Club—"A Day's Elephant Hunting in Essex" served admirably to direct the attention of amateurs to the fascinating history of the Thames Valley as revealed by the discoveries of Sir Antonio Brady of Mammoths at Ilford, and several graphic reports from his pen in his own newspaper (the *Bayswater Chronicle*), the *Leisure Hour* and the *City Press*, made our Club widely known and appreciated. At the close of the first year's work, Mr. Walker was unanimously elected an Honorary Member in grateful recognition of the services he had rendered to the infant society. In late years the pressing claims upon his time as a journalist allowed him fewer opportunities of attending the Saturday afternoon meetings, but he was always to the fore with his pen and purse in any investigations or plans interesting to the Club, and his death on February 13th, 1900, came as a great shock and grief to his numerous friends both within and without our ranks.

As a summary of Mr. Walker's public career we cannot do better than reprint the appreciative notice from one who knew him well, which appeared in the *Bayswater Chronicle* at the time of his death :—

"It is above all things as a citizen and a believer in 'the religion of humanity' that Mr. Walker would wish to be remembered among his neighbours and friends. Citizenship was to him a part of personal religion, and he counted among his friends the ministers of the Jewish Church, members of the Roman Catholic communion, Anglican clergy and missioners, and Nonconformists of every kind. He was the friend of all sincere enthusiasms which made for social freedom and order and for a broad and many-sided life. He was keenly interested in modern Biblical criticism, and was a pioneer of liberal thought in the realm of science; espousing the principle of evolution at a time when its acceptance was regarded as heterodoxy of the most dangerous kind. The present writer well recalls public lectures and meetings at which antagonism between modern science and evangelical doctrine was still sharp and sore; and it was on such occasions that Mr Walker would throw himself into the breach and defend the former both from the Christain and the human standpoint, with an earnestness which showed that he held the new truth as passionately as he had once held the old. Sharing with his brother (Mr. Thomas Walker, of the *Daily News*), the heritage of a Puritan

temperament and ancestry, he knew deeply and intimately the struggle between the new and old forms of faith, and was full of wise sympathy for those passing through phases of intellectual and spiritual doubt.

"He was born on March 14th, 1833, and his boyhood was spent at Northampton, at a time when the regular appearance of the green-covered numbers of Dickens' earlier novels began to loom as large as those of Scott's on the mental horizon of the schoolboy. In early youth he came to London, and laid up vivid memories of the acting of Phelps in Shakespearean tragedy at Sadler's Wells. But social and educational movements soon made an imperative claim upon his heart, and for forty-five years he devoted the best of his leisure and energy to the promotion of scientific knowledge and culture, especially among the young and those deprived of collegiate advantages. He threw himself heartily into the work of the Early Closing Association, of which he was for some years secretary, and at the same time pioneered the Saturday Half-Holiday movement in the direction of natural history and archæological research. His little volume, *Saturday Afternoon Rambles Round London*, is a delightful memorial of some of the first excursions of this kind. He mastered the geology, botany, and entomology of London and the home counties, kept pace with every step of modern astronomy, the exploration of Egypt, and many other departments of antiquarian lore. He was one of the most popular conductors of natural history excursions, or, indeed of visitors to any shrine sanctified by the beauty of nature, or the history of the past. In 1874 he came to this neighbourhood to take up the editorship of the *Bayswater Chronicle*, which he only relinquished within a few months of his death. He founded the West London Scientific Association and Field Club, lectured frequently at clubs and institutes of all denominations, and took an unflagging interest in every development of municipal life. He rejoiced in the progress of the education of women, and their entrance into the higher scholarship and science. Himself a staunch Gladstonian in politics, feeling, too, strong sympathies with collectivist ideals, he never failed in justice or courtesy to the representatives of other political creeds, and was always ready to find common ground with them in any scheme for the benefit of the helpless and oppressed. He was a Fellow of the Geological Society and a member of the Essex Field Club, and was for many years on the Council of Westbourne Park Institute. In 1880 his vigorous crusade in the columns of this paper against a well-known gambling saloon in Monmouth Road, which had entrapped many inexperienced young men in business in the district, landed him in a criminal prosecution for libel, which formed a memorable and interesting episode in his career. It resulted in the complete triumph and vindication of the journalist and the abolition of the nuisance in question. A presentation was afterwards made to Mr. Walker by residents in the neighbourhood in recognition of his public-spirited action. For the past two years he had gradually failed in health, and he passed away at an early hour on Tuesday morning, in the presence of his wife and daughter."

To a later issue of the same journal, the Rev. Dr. Clifford communicated some interesting reminiscences with which we may conclude this notice of our deeply regretted member:—

"It was in these pages I first made the acquaintance of my dear friend Henry Walker, now nearly a quarter of a century ago. He had visited Praed Street Chapel and given a sketch of the sermon he heard. When Westbourne Park Chapel was opened I came into closer acquaintance with him, and soon learned to appreciate very highly the fine qualities of his strong, balanced and noble character.

"First of all, I was attracted by his wide and accurate knowledge. He had an open mind, and was an eager and strenuous student. To the study of Nature he was devoted with the ardour and insight of a lover. If geology stood first amongst the sciences in his esteem, his lectures on that subject showed that it was first because of its manifold relations to other branches of inquiry. His library forms, to some extent, a history of his mind. It is distinctively choice. Its range is wide; but its treasures are the best on its specially selected themes. Still, his keenest interest was in questions of Biblical criticism and interpretation. I have known few men who were more 'up to date' in the knowledge of all matters pertaining to the history of the growth of the Bible, and the scientific exposition of its contents. He was fully conversant with the best work in this department, and had no misgivings as to the results of that work in the end of the day. Most likely he had known and felt the severity of the conflict between the older and the newer forms of faith; but it was manifest that he had reached the perfect calm of an unhesitating reliance on the infinite love.

"All his studies were dominated by a keen sympathy with human progress. His book on the condition of the people in the East End of London, and his papers on Liverpool, show the absorbing interest he had in everything human. For his was an intrinsically religious spirit: and his motives sprang from divine ideals for himself, for the individual man, for the city and for the race.

"The readers of the *Bayswater Chronicle* need not be told that what he knew and felt he could express with lucidity and strength. He was a master of style. His tastes were literary; and his speeches at the Westbourne Park Institute, and in connection with our Rambling Club will be remembered not only for their fulness of information and rich allusiveness, but also for purity and grace of expression. Nor shall we ever forget his unfailing courtesy and gracious consideration for others. He made me think of Emerson's saying, 'Good manners are made up of petty sacrifices. Temperance, courage, love, are made up of the same jewels.' Such jewels he wore with a naturalness that added to their charm and an unconstraint that became their commendation.

"In the removal of Henry Walker, Bayswater has lost one of its best citizens, a man of blameless character, serene spirit, solid work, and high ideals."

We are indebted to Mrs. Walker for the loan of the excellent photograph from which the plate was taken.

NOTES—ORIGINAL AND SELECTED.

ZOOLOGY.

Otters in the Essex Salt-marshes.—In the local journals of Oct. 1st, 1901, a paragraph concerning the capture of an otter was headed with the sensational line "Sea Otter in the Blackwater." "In the river Blackwater on Friday, not far from where the shark was recently captured, a Mersea fisherman named Reuben Mussett shot a sea otter, a creature never known to have been brought ashore before in the neighbourhood. It is a capital specimen, turning the scale at 27lbs." We allude to this mainly as an excuse for inserting an extract from a letter of Dr. Laver's written at the time:—"The 'sea otter' was a very fine specimen, 4ft. 1in. long, a male, and was shot on the ooze or saltings at Tollesbury. The skin has been preserved by Pettitt for Mr. Stuart-Wortley, of Orleans Cottage, West Mersea. It had been no doubt living on Tollesbury Marshes and in the habit of making excursions into the tide-way. I dare say you are aware that there are now otters on nearly all the marshes round the coast. This is as it was in the early years of 1800, when the otter was a very common beast. I am glad to say that there is a prospect of this interesting animal again being much more abundant than it was some years ago."

Capture of a Porbeagle Shark (Lamna cornubica) near Tollesbury. In the *Essex Herald* for October 1st, 1901, the capture of a shark was reported as follows:—'On Tuesday afternoon, when the Tollesbury fishermen were returning home, a shark was seen swimming near the Naas End. Several attempts were made to capture it, and William Lewis, jun., accompanied by William Lewis, sen., and Garrod, succeeded in getting a noose over his head and fixing it in his gills. He was towed for some distance to the landing stage at the 'Leavings,' frequently turning on his back ready for battle. When dragged upon the mud the shark went through many frantic evolutions, but was at length killed. There is an abundant supply of fish in the Blackwater just now, and the shark is supposed to have followed them. The fish was 6ft. 10in. in length, and was on exhibition at Tollesbury on Tuesday evening. On Wednesday his captors tried their fortune as showmen by taking the shark to Maldon for exhibition." Dr. Laver wrote to us respecting this fish:—"The shark you mentioned is now at Ambroses, the Bird-Stuffer's. I have seen it to-day; it is 7ft. 3in. long, and it is an example of the Porbeagle Shark (*Lamna cornubica*) as you suggested."

Pomatias elegans in a living state near Wormingford.—Dr. H. Laver has kindly forwarded to us a letter recently received from Mr. George T. Rope in which the writer says:—"I have not your list of the Mollusca of the Colchester district by me just now, but as far as I can recollect *Cyclostoma* (*Pomatias*) *elegans* is not included. Having met with this species last autumn at or near Wormingford, I thought it might possibly interest you to know of it. On the 8th of last September (1901) I came upon several 'dead shells' at a spot which I have no doubt you know, about two miles or so from Bures. And with them was a single specimen of *Helix* (*Helicella*) *ericetorum* and

Helicigona lapicida I had no opportunity of searching the spot again until October 2nd, after a heavy rain, and then found three or four *living* examples of *P. elegans*, as well as several more dead shells." [The first record of *P. elegans* in a *living* state in Essex, was by Mr. J. French in the ESSEX NATURALIST for 1890 (vol. iv., pp. 92-93) who found the mollusc at Felstead in a very limited area of about 100 yards in diameter. Recently dead shells have been recorded by Christy at Saffron Walden, and specimens are in the Saffron Walden Museum from Wicken Bonhunt. Semi-fossil shells are common in many localities in the Post-Pliocene deposits. By Mr. Rope's kindness the Essex Museum now possesses specimens of the Wormingford *Pomatias* —ED.]

Variety of Arion ater near Bures.—On September 21st, 1901, I saw a curious variety of *Arion ater*, on the Suffolk side of the Stour, near Bures. The fore-parts, including the shield, were of a delicate cream or ivory tint; the rest of the upper surface pale silvery grey, almost white. The foot was of the colour of an ordinary red cheese. The slug was about full grown and was a beautiful object. I am not at all "well up" in the slugs, but have noticed many striking varieties of this species, differing widely from one another.—G. H. ROPE, Blaxhall, Tunstall, Suffolk.

Aphodii in Epping Forest.—The coleopterous genus *Aphodius*, the members of which live in dung, is well represented in Epping Forest, nineteen species (or exactly half the total number found in the British Islands) having occurred to me during the four years I have been collecting beetles in the Forest district. Many of these are common everywhere, but others are decidedly local It is unnecessary to give a complete list of the Forest Aphodii here, but I may mention the following species as being the most interesting of my captures:—

A, constans, Duft., common from March to May in horse-dung in various parts of the Forest. I have also taken a few specimens in October. Its near ally, *A. ater*, De G., which is generally supposed to be a much commoner species, is, as a matter of fact, comparatively scarce in the Forest. *A. rufescens*, F., not uncommon in some of the outlying fields. *A. conspurcatus*, L., in numbers in a field near Chingford in the late autumn of 1898, and a few have occurred at High Beach; it is also recorded from Loughton in Canon Fowler's *Coleoptera of the British Islands*. *A. sticticus*, Payk, several in horse dung in a space of a few feet only between Chingford and High Beach, May, 1900. *A. zenkeri*, Germ., seven specimens in deer dung not far from the Wake Arms, and one in horse dung at High Beach, July, 1899. *A. luridus*, F., this handsome species is apparently by no means common in the London district, and has hitherto been very scarce in the Forest; I took a male in a field between High Beach and Sewardstone in May, 1898, and two females at Chingford in April, 1900. *A. depressus*, F., a few in a ride between Chingford and Fairmead, July, 1899.—F. B. JENNINGS, F.E.S., Upper Edmonton, October, 1901.

The Blister-Beetle (Lytta vesicatoria) near Colchester.—In the *Times* for September 3rd, 1901, Mr. W. H. Harwood, of Colchester, had the following note, dated August 31st:—"Among the many notable insects which have occurred in unusual numbers this year the blister beetle, or Spanish fly

(*Lytta vesicatoria*), seems worthy of special mention. This splendid species is usually extremely rare in Britain, but in 1837 was found in considerable numbers in Essex, Suffolk and Hampshire. About 1875 it was again taken near Colchester by Mr. J. G. Grapes, and more recently it has been found sparingly in Cambridgeshire by the Hon. N. Charles Rothschild and others. Mr. Donisthorpe also obtained 11 specimens in the same county this year, after spending a considerable time in searching for them. Near Colchester, a working man who was out with his butterfly-net one summer morning chanced to notice several ash trees which had been almost entirely denuded of their leaves, and while he was examining into the cause he saw one of the beetles flying towards him, its glittering armour resplendent in the sunshine. This he netted, and presently came to another tree, upon which were a large number of specimens within easy reach, and proceeded to bottle some eighty of them. Unfortunately, he did not know what an important capture he had made, and left most of the specimens in the bottle till they were spoiled, but pinned a few and recently brought them to me to determine. Having been told by the late Dr. Churchill where he had principally noticed the species in 1837, I visited the district, and found that scores of trees over a wide area showed unmistakable signs of its ravages. To account for the amount of feeding the beetles must have been present in enormous numbers, as many of the trees are of considerable size, and nearly all had been extensively eaten. I have frequently looked for them in the same locality myself in previous years, but never had the good fortune to find them, and felt more than a little disappointed when I saw that I had this year missed such an opportunity as I shall probably never have again."

BOTANY.

Centaurea solstitialis and Triglochin palustre near Witham.—Possibly the two following records may be of interest to the readers of the ESSEX NATURALIST :—

Centaurea (*Calcitrapa*) *solstitialis*.—Star-Thistle. This occurs as a casual in fields of lucerne, but although I have searched such localities for many years, it did not come under my notice until the August of 1901, when it was found in plenty at Witham.

Triglochin palustre was also found about the same time in the above parish.

EDWIN E. TURNER, Coggeshall, Essex.

METEOROLOGY.

Meteorological Statistics at Colchester.—Mr. H. Goodyear, the Borough Surveyor at Colchester, states that meteorological readings have been taken in his office for the last 15 years, and he gives some interesting statistics. The rainfall for the year 1901 was only 14·11 inches, the smallest annual rainfall ever recorded in Colchester, and for that matter in any town in England, and excluding towns of less than 30,000 inhabitants, Colchester is the dryest town in England.

The weather has been exceptionally bright also, as there were only 105 days on which rain fell; and this is also unprecedented.

The following is a table of statistics for the last 15 years, the record readings being distinguished by an asterisk :—

Date.	Tl. depth of rain for the year.	Number of wet days.	Greatest rainfall in 24 hours.	Greatest Cold.	Greatest Heat.	Highest Barometic Reading.	Lowest Barometic Reading.
1887	17·25	152	0·73	20°	90°	30·85	28·55
1888	23·40	173	1·01	17°	86°	36·85	28·66
1889	23·31	159	1·15	10°	86°	30·78	28·84
1890	22·05	166	0·78	11°	78°	30·70	28·47
1891	23·82	168	1·00	12°	79°	30·78	28·40*
1892	26·68*	136	1·60	7°	79°	30·62	28·86
1893	19·20	148	1·30	11°	87°	30·80	28·63
1894	23·70	188*	0·85	14°	87°	30·65	29·08
1895	19·90	131	0·85	Zero*	82°	30·73	28·75
1896	22·84	146	1·35	22°	91°	30·90*	28·45
1897	24·50	139	1·76*	20°	91°	30·79	28·55
1898	18·12	128	0·76	19°	92°	30·77	28·73
1899	19·60	129	1·06	18°	90°	30·88	28·64
1900	15·12	144	0·67	15°	92½°*	30·66	28·77
1901	14·11*	105*	0·85	19°	89°	30·77	28·45

MISCELLANEA.

Queen Elizabeth's Lodge and Epping Forest.—By a strange coincidence I had occasion to-day to refer to a volume of *Household Words* for 1851. Under date May 10th—just half-a-century ago to the day—wherein is an article on "Epping Forest" which from its internal evidence is from the pen of Charles Dickens. No railway then passed through the district, Hainhault Forest was yet undisturbed and unstubbed, though but two years later it was speedily and ruthlessly destroyed; and the nearest station was at Ilford, some three miles distant. Some years ago I had marked this in my copy for a notice in the ESSEX NATURALIST, but had quite forgotten it, but I think the extract concerning Queen Elizabeth's Lodge is worthy of reiteration in our journal. It is, however, not a portion of the article itself, but a quotation from William Howitt's *Year Book of the Country* :—

"We take one long view from a hill top of the far spread country, and mount our own vehicles, and away. Away! but whither! To the Old Lodge of Queen Bess. Old Lodge! the hand of the past is impressed upon thee! and has given thee a character. It has invested thee with the poetry of nature. Storms roaring through the huge elms that stand near—old companions; fierce winters beating on thy steep, gabled roof, and tinting thy framed walls; autumns and springs and hot-baking summer—a long series—come across the imagination, as we think of thee. The broad easy oaken staircase up which the heroine of the Armada, and the Queen of Scots tragedy, is said to have ridden to her dining room, the tapestried chamber, and the banqueting hall please me; but, far more, the ancient desolateness without and around! . . . . . We walk for miles in green glades, and beneath the close covert of the green boughs of the hornbeam trees. . .

. . . . We walk and dream—and miles of profoundly solitary woods, and old solitary Jäger-houses, and primitive villages in deep remote glens, and antiquated towns in rarely visited regions, rise before us as we go." How changed is all this now!

The whole article (some eight columns) is full of interest, and was written in view of a Bill in Parliament for the enclosure of Epping and Hainault Forests. The concluding paragraph is as follows :—" The Commissioners of Woods and Forests may, perhaps, think they are acting quite poetically in saying with Milton, in 'Comus.' 'To-morrow to fresh fields and pastures new'; but 'fresh fields and pastures new' obtained by the destruction of the only metropolitan forest, would be a metamorphosis which the London public would never cease to deplore."

At that date (1851) and later, the writer, though then a mere boy, can well remember yet, the Forest district as it was; having frequently accompanied his grandfather in various drives; when the "Cherry Pie House" in Wanstead "Town" and the Eagle at Snaresbrook, were the most quiet and primitive of inns, for the entertainment of "man and beast"—where hundreds of acres of land now built over were dense and open forest, which extended beyond the High Stone nearly up to Leytonstone and right away to Bushwood; while the triple avenues of the latter stretched nearly as far as Cannhall.—WALTER CROUCH, Wanstead, May 10th, 1901.

Ancient Boat found about 1830 in the Lea River Deposits near Temple Mills.—In connection with the finding of the so-called "Viking Ship" at the excavations at Walthamstow (ante p. 151 and plate III.) it may be interesting to recall the account of the discovery of an ancient boat given in Robinson's *History of Hackney*.[1] It was found (*circa* 1830) in excavating the East London Company's Reservoirs a little to the north of Temple Mills, between those marshes and Lea Bridge. The boat lay at a depth of about 4 feet below the surface of the marsh; it was "embedded in a stratum of black-clay with shells intermixed: this stratum continues of the same quality to the depth of 5 feet; above the boat there was a stratum of yellow clay about 4 feet deep. The bottom of the boat was decayed, and at the end nearest the bow it was very imperfect, and broke into pieces when it was attempted to take it out of the place of its deposit, but left an impression from which a sketch was taken. Its dimensions were 20 feet from head to stern, 6 feet wide, and 18 inches deep; it was what is termed clinker-built, the joints being made tight with a cement in which cow-hair was used." A plate of sections is given, with a plan of the river, showing the spot at which the boat was lying. The details of the sections are examined by Mr. Whitaker in his *Geology of London*, vol. i., pp. 473-4. Maitland (*History of London*) talks of a boat having been found in "Stanstead" at the erection of Stanstead Bridge, but Camden in his *Britannia* fixes the point near the place where the boat is above stated to have been unearthed, by saying that the boat was found, "north of Temple Mills."

1 *The History and Antiquities of Hackney, in the County of Middlesex.* By Wm. Robinson, LL.D., F.S.A., 2 vols., Lond., 1842.

Honorary Members of the Essex Field Club.

Year of Election.

1884 BRITTEN, JAMES, K.S.G., F.L.S., (*Department of Botany, British Museum of Natural History*).

1881 COOKE, M. C., M.A., LL.D., A.L.S.

1902 DALTON, W. H., F.G.S. (*late of the Geological Survey*).

1901 EDWARDS, J. PASSMORE.

1889 EVANS, SIR JOHN, K.C.B., D.C.L., LL.D., D.Sc., F.R.S., V.P.S.A., F.L.S., F.G.S.

1902 FARMER, PROFESSOR J.B., M.A., F.R.S. (*Professor of Botany, Royal College of Science*).

1897 GREENHILL, J. E., *Member of Geologists' Association.*

1881 HARTING, J. E., F.L.S., F.Z.S. (*Member of the British Ornithologists' Union*).

1889 HOLMES, E. M., F.L.S. (*Curator to the Pharmaceutical Society*).

1902 HOWSE, PROFESSOR G. B., LL.D., D.Sc., F.R.S., *Secretary to the Linnean Society, Professor of Zoology, Royal College of Science.*

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1902 READ, C. H., F.S.A. (*Keeper of the British and Mediæval Antiquities, British Museum.*)

1891 ROSCOE, Sir HENRY E., LL.D., D.C.L., F.R.S., F.C.S.

1884 RUDLER, F. W., F.G.S. (*Curator of the Museum of Practical Geology*).

1881 SMITH, WORTHINGTON G., F.L.S., M.A.I.

1893 STEWART, PROFESSOR CHARLES, M.A., F.R.S., F.L.S. *Fullerian Professor, Royal Institution, and Hunterian Professor and Conservator of Museum, Royal College of Surgeons.*

1902 THISELTON-DYER, Sir W. T., K.C.M.G., LL.D., F.R.S., F.L.S. (*Director of the Royal Gardens, Kew.*)

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1883 WOODWARD, HENRY, LL.D., F.R.S., P.G.S., &c.

1902 WOODWARD, HORACE W. B., F.R.S., F.G.S., &c. (*Geological Survey*).

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A RECORD OF LOCAL SCIENTIFIC WORK, 1880—1901.

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